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Short Communication

Hind limb malformation in the tree frog *Corythomantis greeningi* (Anura: Hylidae)

Thiago Silva-Soares[1] and Alexander T. Mônico[1,2]

[1] Instituto Nacional da Mata Atlântica, Laboratório de Zoologia, Avenida José Ruschi 4, 29650-000, Santa Teresa, ES, Brazil. E-mail: thiagosilvasoares@hotmail.com.

[2] Laboratório de Ecologia de Anfíbios e Répteis, Universidade Vila Velha, Rua Comissário José Dantas 21, 29102-770, Vila Velha, ES, Brazil. E-mail: alexandermonico@hotmail.com.

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Palavras-chave: anfíbios, anormalidades morfológicas, deformidades esqueléticas, malformação.

Skeletal deformities in amphibians have been reported for more than 200 years; review of this literature reveals a significant increase in the occurrence of malformations globally (Ouellet 2000, Lannoo 2008, Johnson *et al.* 2010). Moreover, such morphological abnormalities have been documented across a broad array of families and genera that occur in different habitats and microhabitats worldwide (e.g., Mahapatra *et al.* 2001, Piha *et al.* 2006, Medina *et al.* 2013, Wagner *et al.* 2014). In Brazil, abnormalities have been reported in bufonids (Ferreira *et al.* 2014), pipids (Mônico *et al.* 2016a), odontophrynids (Dias and Carvalho-e-Silva 2012), and hylids (Mônico *et al.* 2016b). Although some of these deformations are originated under natural conditions, i.e., derived from parasites as the trematode *Ribeiroia* sp. (Ballengée and Sessions 2009, Lunde and Johnson 2012), they also may represent a growing threat (Hoppe 2000). Hence, the incidence of deformations is now thought to reflect a serious environmental problem (Johnson *et al.* 2003).

Deformations in anurans result from a variety of causes, including both genetic and environmental factors, such as, high concentrations of heavy metals in the environment (Huang *et al.* 2014), exposure to UV-B radiation (Blaustein *et al.* 1997), and parasitic infestation by trematodes (Johnson *et al.* 1999, Kiesecker 2002) and microbes, as well as other diseases (Sessions and Ruth 1990). However, the principal agent is thought to be environmental pollution by pesticides and other chemicals used in agriculture (Ouellet *et al.* 1997, Marco *et al.* 1999, Lannoo 2008, Sparling *et al.* 2015, Koleska and Jablonski 2016). These can stress the organism's physical/chemical balance (Blaustein and Johnson 2003) and their biological functions (Ballengée and Sessions 2009).

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During a nocturnal survey on 3 March 2016 in Cafarnaum Municipality in the northwest part of Bahia state, northeastern Brazil (11.6808° S, 41.3997° W; 780 m a.s.l.), TSS collected an adult male *Corythomantis greeningi* Boulenger, 1896 (SVL = 74 mm) with a malformation of the left hind limb (Figure 1A, C). The frog was found perched on a small tree on a stream edge, near a swamp in a savanna woodland of the Caatinga Biome. The individual, MBML 9072, is deposited in the Amphibian Collection of Museu de Biologia Prof. Mello Leitão, Instituto Nacional da Mata Atlântica, Santa Teresa Municipality, Espírito Santo state, Brazil.

Corythomantis greeningi is endemic to Brazil, where it occurs in xeric and sub humid regions, typically associated to the Caatinga and Cerrado domains (Pombal *et al.* 2012, Godinho *et al.* 2013, Silva *et al.* 2014). It ranges from northeastern Maranhão state to central Tocantins state, and from north-central Goiás state east to the western edge of the coastal plain (Silva *et al.* 2014, Frost 2017).

We captured 74 other frogs at the site, these included: *Boana crepitans* (Wied-Neuwied, 1824); *Trachycephalus atlas* Bokermann, 1966; *Scinax* gr. *ruber*; *Rhinella* spp.; *Physalaemus albifrons* (Spix, 1824); *P. cicada* Bokermann, 1966; *Leptodactylus macrosternum* Miranda-Ribeiro, 1926; and *L. troglodytes* Lutz, 1926, and also six other individuals of *C. greeningi,* but none other except specimen MBML 9072 had an externally visible morphological malformation. The collecting site is near a small concrete bridge that crosses a stream that is connected to a water dam; the swamp is clearly used by cattle that left footprint in the area being used by some anurans (e.g., *Boana crepitans*) as calling sites. Although there was anthropogenic interference in the environment, no human habitations were noted around the area. We are not able to determine if the deformation developed naturally or that the malformation derived from some physical-chemical environmental or biological stress.

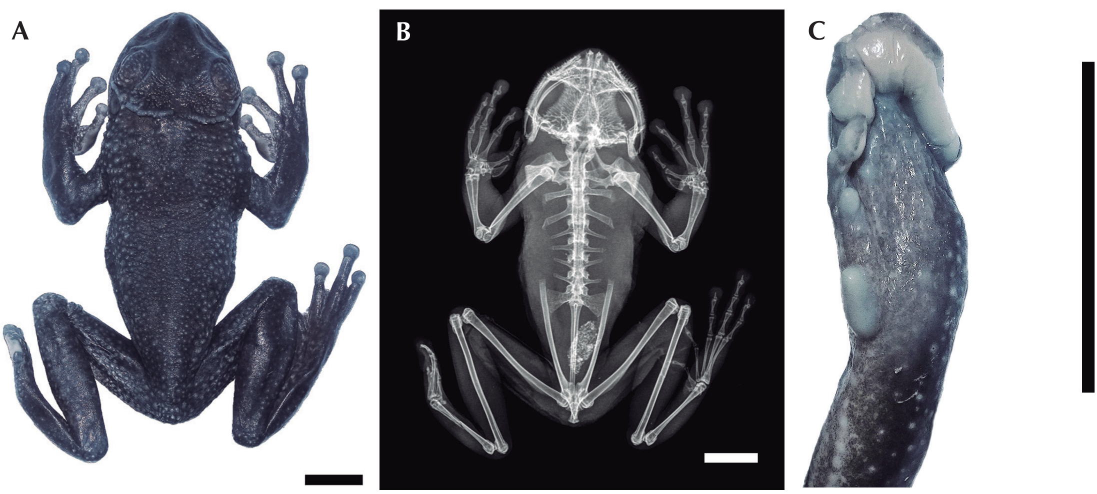

Figure 1. Adult male *Corythomantis greeningi* with a malformed left hind limb. (**A**) General perspective of limbs on fixed specimen, (**B**) radiography of left hind limb and (**C**) approximation of left hind limb malformation. Scale bars = 1 cm.

Following the classification of Meteyer (2000), the malformation of *C. greeningi* is brachydactyly, in which, according to the radiography, toes are shortened by the loss of phalangeal bones, with metatarsal bones fused and phalanges not fully developed (Figure 1B). When captured and handled, the frog did not demonstrate any unusual behavior that might be associated with its malformation. Although it lacked functional toes and adhesive discs, the malformation did not seem to have hindered its natural growth and development.

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