



# Limb Malformation in an Asian Common Toad, *Duttaphrynus melanostictus* (Schneider 1799) (Anura: Bufonidae), from Hong Kong

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The increasing incidence of amphibian malformations has raised considerable concern in the past decades. Numerous studies reveal different causes of malformations; these include parasitic infections, predation, and pollution (Ballengee and Sessions 2009; Peltzer et al. 2011). Malformed frogs have been reported worldwide; however, few cases have been documented from southern China. Herein we describe a deformed Asian Common Toad (*Duttaphrynus melanostictus*) from Hong Kong.

Asian Common Toads are medium-sized bufonids (male SVL 72–81 mm, female SVL 95–112 mm) that are widely distributed throughout southern and southeastern Asia, including China and Indochina to the Malaysian Peninsula; the species also has been introduced to New Guinea and Madagascar (Fei et al. 2012; Frost 2021). These toads exploit a wide variety of habitats, including forests, grasslands, cultivated fields, and parklands, and utilize as breeding habitats various aquatic situations that range from marshes, temporary ponds, puddles, and artificial ponds to slow-flowing rivers and streams (Lau 1998).

At 1915 h on 24 June 2021, we found a deformed juvenile *Duttaphrynus melanostictus* (Fig. 1) in an urban park at Hung Shui Kiu, New Territories, Hong Kong S.A.R. (22°25'53.3"N 113°59'47.2"E; elev. 11 m asl). A closer examination revealed multiple left hindlimb malformations (Meteyer 2000), a shortened left tibia-fibula (hemimelia) and only three toes (ectrodactyly), all of which were short (brachydactyly). We collected the toad and deposited the specimen in the Herpetological Collection of Kadoorie Farm and Botanic Garden (KFBG), Hong Kong (KFBG 14601). Pertinent measurements were SVL = 32.7 mm, length of the right hindlimb = 38.2 mm, and length of the deformed left hindlimb = 24.4 mm; both forelimbs were normal.

Malformations in anurans have been reported on all continents for more than 400 species (Mollov et al. 2010; Jaman et al. 2017; Marín-Martínez and Botero 2019). Of the various possible causes of amphibian deformations, chemical agents



**Fig. 1.** A juvenile Asian Common Toad (*Duttaphrynus melanostictus*) (KFBG 14601) (SVL = 32 mm) with a shortened left tibia-fibula (hemimelia) and only three toes (ectrodactyly), all of which are short (brachydactyly). Photographs by H.Y. Yeung.

and pollutants in the habitat (e.g., pollution from agricultural activities, including pesticide exposure, and oil and gas development) have been considered major factors (Lannoo 2008; Koleska and Jablonski 2016), with degraded habitat located in landscapes subject to agricultural activities contributing to higher rates of morphological anomalies (Taylor et al. 2005; Jaman et al. 2017; Haas et al. 2018) when compared to preserved remnants of natural habitats (Peltzer et al., 2011; Marín-Martínez and Botero, 2019; Mónico et al. 2019).

During a previous survey, we observed breeding pairs and larvae of *D. melanostictus* in polluted nullahs (temporary



**Fig. 2.** Breeding and larval habitat of Asian Common Toads (*Duttaphrynus melanostictus*) in an area adjacent to where the deformed juvenile was encountered. Photograph by H.Y. Yeung.

channels or riverbeds) and ponds in areas near the site where we encountered the malformed juvenile (Fig. 2). These bodies of water receive severe pollution discharges from nearby farmland, car washes, and residential areas. Because pollution is known to affect larval growth and development in *D. melanostictus* (Goswami et al. 2013), we believe that the malformed individual described herein likely was contaminated during development in polluted larval habitat.

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