

## Photographic record of subaudible vibration (SAV) in the American crocodile *Crocodylus acutus*

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The American crocodile *Crocodylus acutus* is widely distributed in coastal and lowland wetlands in the northern Neotropics (Thorbjarnarson et al., 2006; Rainwater et al., 2022). For this species, courtship and mating are exclusively aquatic activities where the courtship is usually initiated by the female, and typically consists of a somewhat stereotyped sequence of behaviours with the female snout-lifting, swimming in slow circles around the male, or placing her head on the snout or back of the male (Thorbjarnarson, 1989). The main advertisement display of the male is a series of one to three headslaps, also males frequently respond to the female by emitting a very low frequency sound, which is below 100 Hz and even in the infrasound below the limit of human hearing at around 10 Hz (Dinets, 2013). This is termed subaudible vibration or SAV (Thorbjarnarson, 1989; Grigg & Kirshner, 2015) and is created by rapid contraction of the male's trunk muscles beneath the water surface (Lang, 1989; Boucher, 2017), but at the water surface, this creates 'dancing' water droplets caused by Faraday waves that can result when a liquid overlies a solid surface (Dinets, 2013; Grigg & Kirshner, 2015). It is thought that SAVs may be sexually stimulating during courtship and are a good predictor of further courtship (Garrick & Lang, 1977; Grigg & Kirshner, 2015). The SAV is released from a typical 'head oblique, tail arched' (HOTA) posture, a behaviour well known in the American alligator *Alligator mississippiensis*, where it is

significant in courtship and in the establishment of territories (Vliet, 1989; Grigg & Kirshner, 2015).

On 8 May 2018 at 11:10 h, in the 'water hazard' at Marina Vallarta Golf Club (20° 40'00.1" N, 105° 15'46.4" W; altitude < 5 m) in Puerto Vallarta, Jalisco, Mexico, we observed and photographed an adult male *C. acutus* (total length ≤ 3 m) in the presence of a smaller female. The male was in HOTA posture and a 'water dance' was visible over its dorsal surface (Fig. 1). The crocodile held the pose for 2 minutes during which time we observed only one 'water dance' for a few seconds.

Garrick & Lang (1977) described in detail the social signals and reproductive behaviour of *C. acutus* and present a drawing of a male *C. acutus*, traced from movies and still photographs, with SAVs radiating from the body. To our knowledge, this note represents the first published photographic record of subaudible vibration (SAV) and visible 'water dance' in the American crocodile. On this occasion, mating was not observed but it has occurred on this golf course as, every year for the last 25 years, we have observed four to six nests with hatchlings. Thus, this man-made habitat helps to conserve the American crocodile on the west coast of Central Mexico (Mc Cann et al., 2016).

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**Figure 1.** American crocodiles *Crocodylus acutus* from Puerto Vallarta, Mexico - Female head (left) and male (centre) in 'head oblique, tail arched' posture with water dance droplets on its back resulting from subaudible vibration

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