

SHORT COMMUNICATION

# First record of necrophilia in *Smilisca baudinii* (Anura: Hylidae) from Mexico

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Necrophilia, also known as necrogamy (Bettaso *et al.* 2008), thanatophilia (Patel *et al.* 2016), and Davian behavior (Dickerman 1960), is a form of reproductive behavior in which a living specimen (usually a male) attempts to copulate with a dead conspecific (usually a female). It has been reported in all major extant groups of tetrapods (Caldeira-Costa *et al.* 2010). Among anurans it has been reported in at least 37 species from six families: Ascaphidae (one species), Bombinatoridae (1), Bufonidae (15), Hylidae (8), Leptodactylidae (1), and Ranidae (11). This list suggests that this behavior occurs more often in frogs with explosive reproduction (see Pintanel *et al.* 2021 and Costa-Campos *et al.* 2021 for recent reviews).

Necrophilia generally does not result in successful reproduction and may represent a

waste of time and energy for the males (reviewed in Marco and Lizana 2002). However, the case of *Rhinella proboscidea* (Spix, 1824), in which the male can promote the expulsion and fertilization of the oocytes from dead females by compressing their abdominal cavities with his arms, was hypothesized as “functional necrophilia” because it could minimize the losses of both sexes during the explosive reproduction events and favors the strongest and most persistent males (Izzo *et al.* 2012).

Here we provide the first report of necrophilia in the common Mexican tree frog *Smilisca baudinii* (Duméril and Bibron, 1841). This hylid reaches a snout–vent length of 76 mm in males and 90 mm in females, has a wide and flat head indistinct from the body, and is distinguished from other species by having a row of warts along the lower part of the arm (Lee 2000, Tunstall 2021). Its wide geographic range encompasses several biogeographic provinces, ranging from the extreme southcentral United States to southeastern and southwestern Costa Rica (Lee 2000, Savage 2002, Powell *et al.*

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2016). *Smilisca baudinii* usually reproduces between the months of June and October (Duellman 1970) in ephemeral ponds following heavy rains (Malone 2004).

On 08 July 2021 at approximately 07:30 h, in a dry forest setting located in Ejido el Tablón, municipality of El Rosario, Sinaloa, Mexico (23°04'57.84" N, 105°59'25.22" W; 68 m a.s.l.), we found two males in amplexus with a dead female on the shore of an ephemeral grassy pond (Figure 1). One male was found in axillary amplexus, but directed to the flank of the female; while the other male was found amplexing the female's hind legs. We also noticed that the female was dead and missing the upper part of its snout (for unknown reasons) and that its abdomen contained abundant oocytes although none were expelled.

Necrophilic behavior has been reported previously in hylids with explosive reproduction (Pintanel *et al.* 2021). Thus, it is not surprising that necrophilia occurs in *Smilisca baudinii*, a species with explosive breeding behavior (Donnelly and Guyer 1994). It is also important to mention that interspecific amplexus involving *S. baudinii* and other species has been previously reported (e.g., Streicher *et al.* 2010, Heyborne *et al.* 2018, Vásquez-Cruz *et al.* 2019). These reports of misdirected amplexus (interspecific and necrophilia) are considered maladaptive (Ayres 2010) and suggests little or no ability to recognize viable potential reproductive partners when reproductive pressure is high (Marco and Lizana 2002).

The absence of egg deposition does not preclude functional necrophilia in *Smilisca baudinii* since we did not continue with the observation until amplexus was completed. In addition, because the males were not found in complete interaxillary amplexus, we believe their positions would have hindered the expulsion of the oocytes.

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**Figure 1.** Two male *Smilisca baudinii* in amplexus with a dead conspecific female along the shore of grassy ephemeral pond, Sinaloa, Mexico (LACMPC 2753).

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