

## A caution on handling *Trachycephalus venulosus* (Anura: Hylidae); toxic effects of skin secretion on human eyes

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The milky or veined treefrog *Trachycephalus venulosus* (Laurenti, 1768), is a large, robust, arboreal species distributed widely across the neotropics (Fig. 1). It is the only member of its genus (totalling 12 species) to occur in Central America (Frost, 2020) and inhabits a range of primary and disturbed habitat types. It can be identified using the guide to Central American amphibians by Kohler (2011).

Numerous guidebooks heed caution when handling *T. venulosus*, referring to its ability to secrete a large amount of sticky, white, volatile, poisonous, alkaline, water insoluble mucus that is highly irritating to mucous membranes (Savage, 2002; Kohler, 2011). These collagenous protein-based secretions have been demonstrated to discourage potential predators (e.g. snakes - Yeager et al., 2019), as well as reduce cutaneous water loss (McDiarmid, 1968). The exact chemical composition of *T. venulosus* secretions remain undetermined; however, various literature documenting the effects of *Trachycephalus* secretions suggest they can cause harm to humans (Smith, 1941; Duellman 1956; Tanecs & Littlefair, 2014). According to those studies, human reactions to *T. venulosus* secretions can be extremely painful, and include symptoms such as sneezing, skin irritation, rashes, swelling, and even temporary blindness. In support, the following note details my own experiences with the skin secretions of this frog.

On the 25 September 2015, I was in the region of La Democracia, Belize District, Belize (17°21'27.9"N 88°32'32.9"W). At 21.15h, I encountered an adult hylid frog on a high branch in vegetation next to a water pool. At that time, I was not familiar with *T. venulosus* and in order to make an identification I carefully captured the frog (sex unknown) with moist (insect-repellent-free) hands and promptly released it on a lower perch so I could photograph and observe its defining characteristics more closely. The individual was held in-hand for less than 20 seconds, not subject to excessive stress, nor did it visibly secrete any white mucus in response to capture. However, within five minutes of capturing the individual, I began to develop a rash-like burning sensation on my forehead, after unintentionally wiping sweat from it using my hand. Before I understood what was causing the irritation, I proceeded to further touch and wipe my forehead, which combined with running sweat, then transferred the irritant into my eyes. Immediately, I developed intense localised pain in both eyes, visual impairment and uncontrollable eye watering as a response. Understanding the possible seriousness of my situation, I quickly made my way to a nearby tap and mirror and proceeded to wash my hands and face with soap, and flush my eyes with fresh water. For about 30 minutes after, I could barely keep both eyes open owing to sharp burning pains, despite vigorously

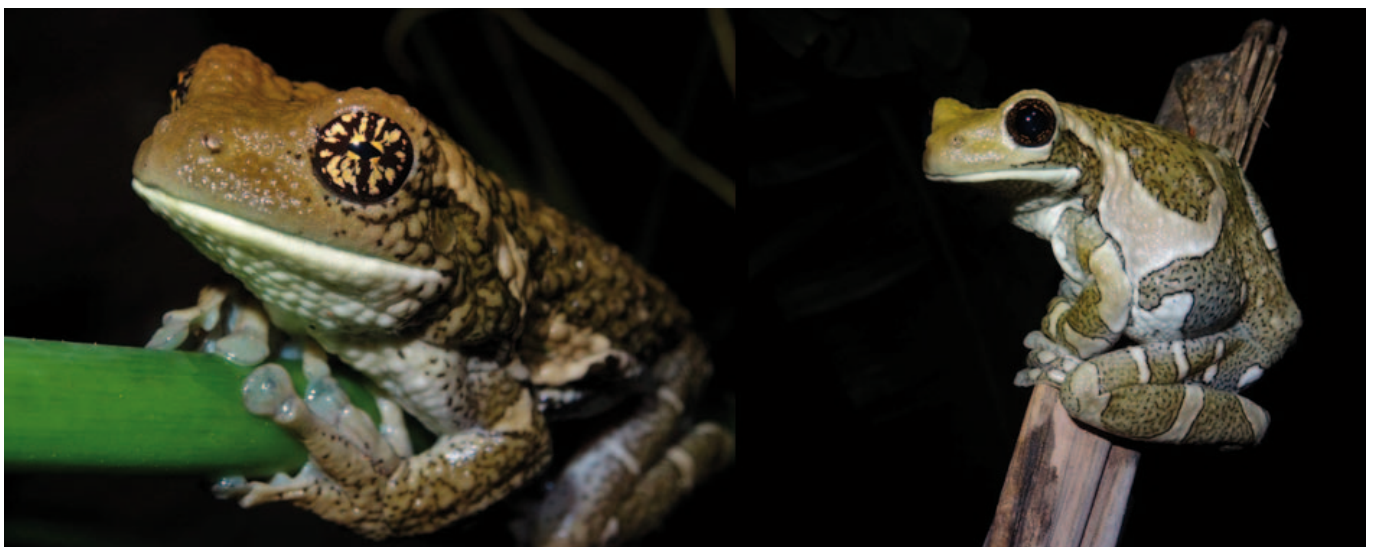


Figure 1. *Trachycephalus venulosus* at the reported locality in Belize

irrigating them with water during that time. In total, it took approximately 90 minutes for normal vision to return and the pain to subside, with no side effects other than bloodshot eyes and slight inflammation of the facial skin around them. Now recovered, I successfully identified the hylid species as *T. venulosus*, and finally understood the error of my ways. I am a white Caucasian male with no known allergies and at the time was 22 years old.

In addition to documenting first-hand the effects of *T. venulosus* secretions, this case serves as a reminder to myself, and others, for the need to familiarise ourselves with the species present at study locations, follow correct fieldwork and handling protocols, always consider the potential hazards posed by native wildlife, and to avoid lone fieldwork where possible. Concerning *T. venulosus* and ideally all wild amphibians, capture and any necessary handling should always be performed wearing appropriate sterile gloves (Greer et al., 2009), to minimise any risk to the animal and provide a protective barrier between yourself and the amphibian.

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