***LITHOBATES BERLANDIERI* (Rio Grande Leopard Frog). PREDATION.** *Lithobates berlandieri* (Ranidae) has a wide distribution from central Texas and southern New Mexico in the USA through central-eastern Mexico in the states of Chihuahua, Coahuila, Durango, Nuevo León, Tamaulipas, Zacatecas, San Luis Potosí, Querétaro, Hidalgo, Puebla, and Veracruz; in addition, the species has been introduced in California and Arizona (USA) as well as Baja California (Mexico). *Lithobates berlandieri* ranges from sea level to 2595 m (IUCN SSC Amphibian Specialist Group 2022:e.T62130070A3071717, 14 July 2023) and is associated with different types of aquatic environments, including streams, springs, rivers, and mainly permanent ponds. The vegetation on the edge of the water bodies, their root systems, and rocks are essential for *L. berlandieri* for refuge (Lemos-Espinal and Smith 2007. Anfibios y Reptiles del Estado de Coahuila, México. CONABIO, Mexico City, Mexico. 550 pp.; Dodd 2013. Frogs of the United States and Canada. Johns Hopkins University Press, Baltimore, Maryland. 982 pp.). Like other anurans, the tadpoles and metamorphs of *L. berlandieri* are highly palatable (Dodd 2013, *op cit.*). *Thamnophis eques* (Mexican Gartersnake), *T. marcianus* (Checkered Gartersnake), and *Quiscalus mexicanus* (Great-tailed Grackle) have been identified among their predators (Ideker 1976. Texas J. Sci. 27:244–245; www.amphibiaweb.org/species/4990, 28 Jul 2023). Here, we document three predation events, one on a tadpole and two on post-metamorphic *L. berlandieri* by *Butorides virescens* (Green Heron). The diet of *B. virescens* includes small fish, a diversity of invertebrates, and *L. catesbeianus* (American Bullfrog) tadpoles (Helm 2012. Northwest. Nat. 93:85–87).

Fig. 1. Adult *Butorides virescens* grasping the hind leg of a post-metamorphic *Lithobates berlandieri* in Veracruz, Mexico.

Fig. 2. Adult *Butorides virescens* grasping a *Lithobates berlandieri* tadpole by the tail in Veracruz, Mexico.

Fig. 3. Adult *Butorides virescens* grasping a post-metamorphic *Lithobates berlandieri* in Veracruz, Mexico.

While performing an anuran acoustic survey in the artificial lakes of the Campus CAD of the Universidad Veracruzana at Xalapa, Veracruz, Mexico (19.51149°N, 96.91611°W; WGS 84), we recorded three predation events on *L. berlandieri* by *B. virescens*. The first event was at 1830 h on 2 May 2021, when we observed a *B. virescens* stalking prey on a rock. When we approached to watch, the *B. virescens* struck the water with its beak and caught a metamorphic *L. berlandieri* by the hind leg (Fig. 1). Subsequently, the *B. virescens* manipulated its prey and swallowed it whole. The second event was at 1800 h on 23 May 2021; similar to the first event, the *B. virescens* was on a rock in the lake, struck the water with its beak, and caught an *L. berlandieri* tadpole by the tail (Fig. 2); the tadpole was subsequently swallowed after a brief manipulation. Finally, the same *B. virescens*, after 5 min of stalking, caught a post-metamorphic *L. berlandieri* using the same strategy (Fig. 3).

The artificial lakes of the CAD campus are made up of a system of permanent and shallow (ca. 0.5 m deep) artificial lakes (ca. 2 hectares); the bodies of water have multiple ornamental volcanic rocks that function as perches for different species of birds, allowing them to stalk prey. These lakes have a high abundance of tadpoles and young frogs throughout the year, which may offer easy prey for opportunistic predators such as herons and other birds living there. To our knowledge, this is the first report of predation on *L. berlandieri* by *B. virescens*.

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***LITHOBATES CATESBEIANUS* (American Bullfrog). OCULAR ULTRA-VIOLET REFLECTIVITY.** Biological fluorescence is a naturally occurring phenomenon that has been reported across

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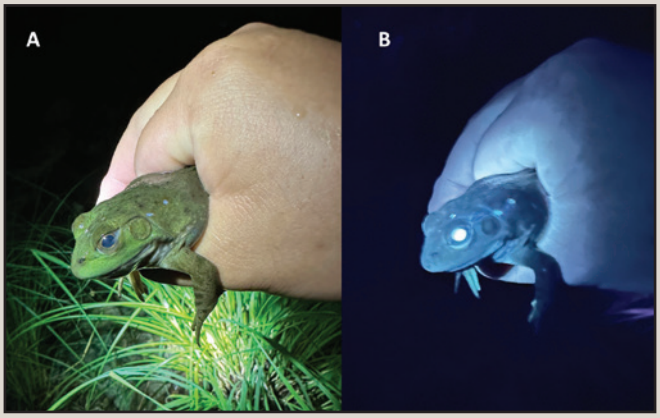


FIG. 1. A) *Lithobates catesbeianus* under a 400-lumen white light, captured at a former trout farm in Santa Margarita, California; B) the same *L. catesbeianus* under a 365 nm ultra-violet light.

many taxa (Lagorio et al. 2015. Photochem. Photobiol. Sci. 14:1538–1559). It typically occurs when light transmitted at a high-energy wavelength is absorbed by tissue and reflected back at a lower wavelength, resulting in the emission of fluorescent light (Lamb and Davis 2020. Sci. Rep. 10:e2821). Recently, numerous species of amphibians have been examined for potential fluorescence, with reports that include tiny spot patterns to complete skin fluorescence (Gray 2019. Herpetol. Notes 12:363–364; Lamb and Davis 2020, *op. cit.*; Taboada et al. 2017. Proc. Natl. Acad. Sci. 114:3672–3677). In California, Alvarez et al. (2023. Sonoran Herpetol. 35:151–153) reported ocular reflectivity from ultra-violet light in ranid frogs in Central California. Here, we report an additional case of ocular fluorescence in an eastern North American ranid frog that occurs in California as an invasive species.

While conducting a peer-level workshop to detect and identify declining amphibians, we surveyed a former trout farm in Santa Margarita, San Luis Obispo County, California, USA (35.37707°N, 120.66495°W; WGS 84; 415 m elev.). Our surveys were conducted in April 2023, from 2000–2300 h, and included the use of hand-held flashlights to detect the eye shine of amphibians (Corben and Fellers 2001. Herpetol. Rev. 32:89–91). We walked the pond edge, searching the lentic habitat for amphibians. Each specimen was carefully hand-captured, inspected for species identification, sex, age class, and ectoparasites, and subsequently released.

Over two nights we hand-collected 53 adult *Rana draytonii* (California Red-legged Frogs) and four adult *Lithobates catesbeianus*. The eyes of *R. draytonii* were known to have a high level of ultra-violet light reflectivity (Alvarez et al. 2023, *op. cit.*); however, we used a 400-lumen white light to inspect captured *L. catesbeianus* and followed up by exposing the frogs to an ultraviolet light (365 nm) for 5 to 10 seconds (Fig. 1A, B). We noted that all *L. catesbeianus* showed a similar fluorescence from the eyes to that reported for *R. draytonii* and *R. boylii* (Alvarez et al. 2023, *op. cit.*). Based on the report by Alvarez et al. (2023, *op. cit.*), we understand that this ocular reflectivity is uncommon or underreported worldwide, with only two non-ranid species reported as showing similar patterns, in addition to the two ranids previously mentioned.

Numerous authors have reported fluorescence from amphibian skin (Taboada et al. 2017, *op cit.*; Gray 2019, *op. cit.*; Lamb and Davis 2020, *op. cit.*). The role of fluorescence is a subject of consideration by many researchers (Lagorio et al. 2015, *op. cit.*; Taboada et al. 2017, *op. cit.*; Kong et al. 2023. Herpetol. Notes 16:161–163) with no current consensus. Several authors have reported that a range of taxa may be using fluorescence as a means of interspecific or intraspecific communication (Lim et al. 2007. Science 315:481; Sparks et al. 2014. PLoS ONE 9:e83259; Prötzel et al. 2018. Sci. Rep. 8:1–9). It is not clear how this physical character may be used by *L. catesbeianus*. Alvarez et al. (2023, *op. cit.*) suggested ultra-violet reflectance may play a role in one species avoiding predation by the other; however, it is not currently known how ultra-violet reflectance may be used by this and other species.

We thank Ken Haggard and Polly Cooper of the San Luis Sustainability Group for generously granting access to the former trout farm to conduct peer-level workshops and surveys, and for supporting a robust population of California red-legged frogs on their property. The *L. catesbeianus* were collected under a California Department of Fish and Wildlife Scientific Collecting Permit issued to Jeff Alvarez (SCP-000040). We are also grateful to Michaela Robbins and Jackie Hancock and the California Central Coast Chapter of The Wildlife Society for supporting this work and for facilitating access to the site.

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***LITHOBATES SYLVATICUS* (Wood Frog). EGG MASS DEPOSITION.** *Lithobates sylvaticus* is associated with short, explosive breeding events. These events have been documented in the late winter months for populations in the southeastern United States, such as eastern Tennessee (Meeks and Nagel 1973. Herpetologica 29:188–191) and northeastern Alabama (Davis and Folkerts 1986. Brimleyana 12:29–50). A *L. sylvaticus* population is known from a hardwood forest vernal pool on the Cumberland Plateau of White County, Tennessee (35.84787°N, 85.29471°W; WGS 84; 552 m elev.). Two communal aggregations of *L. sylvaticus* egg masses were observed at this location on 30 December 2021. These were located at the northwestern and southeastern edges of the vernal pool. Each was estimated to contain more than 50 individual egg masses. Additionally, several *L. sylvaticus* adults were also observed at this location on 1 January 2022 (Austin Peay State University [APSU] 20145, photo voucher). To the best of my knowledge, this report represents the first documented December breeding event for *L. sylvaticus* with communal egg mass deposition. Populations on the Cumberland Plateau of Tennessee are near the southwestern limit of this species' range (Corser 2007. Am. Midl. Nat. 159:498–503). The earliest documented *L. sylvaticus* breeding event occurred in Van Buren County, Tennessee, on 6 January 2009, where both adults and egg masses were reported (Brown 2009. Herpetol. Rev. 40:362). The Van Buren County site is also on the Cumberland Plateau and is ca. 21 km south of the White County population.

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***PHASMAHYLA GUTTATA* (Spotted Leaf Frog). CONTRACTION.** Anurans can display a diverse and complex repertoire of defensive behaviors to avoid predation (Humphreys and Ruxton 2018. Behav. Ecol. Sociobiol. 2018:1–16; Ferreira et al. 2019. Behav. Ecol. Sociobiol. 73:1–29). A common defense is to remain still and contract the body, generally with closed eyes, while holding the limbs close to the body, facilitating the release of skin secretions, or resembling a dead animal (Ferreira et al. 2019, *op. cit.*).