



# Leucism in an East Asian Bullfrog (*Hoplobatrachus chinensis*) Tadpole from Ba Den Mountain, Vietnam

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Pigmentation in amphibians serves important functions that include thermoregulation, protection against pathogens, and protection against UVB rays (Laumeier et al. 2023). Abnormal and uncommon pigmentation has been reported in a wide range of amphibians, including tadpoles and adults. These include albinism, axanthism, erythrism, and melanism (Allain et al. 2023; Almeida-Reinoso et al. 2023). Leucism, a variant of albinism, is characterized by the total or partial loss of pigmentation resulting in a white or pale body color,

except at the margins of the body and the eyes (Allain et al. 2023; Padhy et al. 2024).

The East Asian Bullfrog, *Hoplobatrachus chinensis* (Osbeck 1765), is distributed widely throughout mainland Southeast Asia to southern China (Frost 2024). Despite being common, leucism has not been documented in wild *H. chinensis*. However, leucism has been reported in a congener (*H. tigerinus*) in India (Padhy et al. 2024). We herein provide the first record of leucism in a *H. chinensis* tadpole from Vietnam.



**Figure 1.** Dorsal and ventral views of a leucistic East Asian Bullfrog (*Hoplobatrachus chinensis*) tadpole at stage 42 (ITBCZ 11154) (left) and of a typical *H. chinensis* tadpole at early stage 42 (ITBCZ 11153). Photographs by Thinh Gia Tran.

At about 2300 h on 16 July 2024, during a herpetofaunal survey, we encountered a leucistic tadpole of *H. chinensis* (Fig. 1) in a pond at the foot of Ba Den Mountain, Tay Ninh Province, Vietnam (11.38667, 106.14528; elev. 34 m asl). After being photographed, the tadpole (ITBCZ11154) was preserved in 70% ethanol and deposited in the Institute of Tropical Biology Collection of Zoology, Ho Chi Minh City, Vietnam (ITBCZ). The individual was determined to be at Gosner stage 42 (Gosner 1960) and identified as *H. chinensis*

based on published descriptions (Aran et al. 2012; Vassilieva et al. 2017; Traijitt et al. 2021; Haas et al. 2022): body shape oval; vent tube directed posteriorly, positioned at the ventral margin; tail tip acute; oral disk positioned ventrally, with relatively large marginal papillae; upper and lower lips separated by an emargination; labial tooth row formula (LTRF) 5(3–5)/5(1–3), with keratodont ridges bearing double rows of conical, needle-like keratodonts; upper jaw sheath with a large medial toothlike projection, and lower jaw sheath with two projections; two large fang-shaped spurs inside the mouth. The leucistic tadpole was whitish-golden dorsally and laterally, with pale patterning (vs. the normal pattern of brown, gray, or olive dorsally and laterally, with scattered black spots) (Fig. 1, Fig. 2). The venter was white, which obscured the gut coil, and the eyes had black irises (normal pigmentation). We measured all tadpoles of *H. chinensis* from the same pond, including the leucistic specimen (Table 1).

Previous studies of leucism in tadpoles have reported various developmental problems. Although some leucistic tadpoles complete metamorphosis successfully (Szkudlarek et al. 2022), others experience slower development or fail to metamorphose entirely (e.g., Smith 2014; Arietta et al. 2020; Gartin and Jessee 2024; Szkudlarek et al. 2022). The whitish or pale coloration of leucistic tadpoles can increase predation risk in nature by making them more conspicuous (Childs 1953; Hemnani et al. 2021; Almeida-Reinoso et al. 2023). However, this lighter coloration can confer a survival advantage on light substrates (Parayko et al. 2023). Additional research is needed to understand how pigmentation influences tadpole development in nature.

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**Figure 2.** A typical East Asian Bullfrog (*Hoplobatrachus chinensis*) tadpole at stage 34 (ITBCZ 11157) (top) and dorsal and ventral views of a typical *H. chinensis* tadpole at stage 43 (ITBCZ 11152) (center and bottom). Photographs by Think Gia Tran.

**Table 1.** Measurements (mm) of East Asian Bullfrog (*Hoplobatrachus chinensis*) tadpoles from Ba Den Mountain, Tay Ninh Province, Vietnam. Dashes denote no data. Characters follow Pezzuti et al. (2021).

	ITBCZ 11157	ITBCZ 11153	ITBCZ 11154	ITBCZ 11152
Stage	34	Early 42	42	43
Pigmentation	Typical	Typical	Leucistic	Typical
TL = Total length	33.06	68.08	58.44	51.85
BL = Body length	10.78	20.77	18.86	19.34
TaL = Tail length	22.28	47.31	39.58	32.51
MTH = Maximum tail height	5.81	9.04	7.93	6.72
IND = Internostril distance	1.36	1.79	1.56	1.79
IOD = Interorbital distance	3.34	6.51	5.88	6.27
TMH = Tail muscle height	3.02	5.73	4.78	4.81
TMW = Tail muscle width	2.16	5.23	4.61	5.05
LTRF = Labial tooth row formula	5(3–5)/5(1–4)	5(3–5)/5(1–3)	5(3–5)/5(1–3)	—
BW = Body width	6.11	11.45	10.70	10.08
BWN = Body width at nostril position	3.70	7.25	5.05	4.49
BWE = Body width at eye position	5.39	10.86	8.86	8.37
BH = Body height	4.87	9.87	8.81	9.79
ESD = Eye–snout distance	3.83	7.36	6.43	6.04
END = Eye–nostril distance	2.27	4.07	3.71	3.93
NSD = Nostril–snout distance	1.69	3.87	3.48	2.17
ED = Eye diameter	1.86	2.80	2.83	2.61
ND = Nostril diameter	0.23	0.38	0.26	0.21
SSD = Snout–spiracular distance	8.18	—	—	—
ODW = Oral disc width	2.34	5.01	3.79	—
DFH = Dorsal fin height	2.14	3.36	2.90	2.15
VFH = Ventral fin height	1.40	1.76	1.44	1.25
SL = Spiracle length	1.49	—	—	—

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