

Predation of an invasive Banded Bullfrog, *Kaloula pulchra* Gray, 1831, by a native Formosa Kukri Snake, *Oligodon formosanus* Günther, 1872, on Little Liuqiu Island, Taiwan

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The isolated islet fauna demonstrates the complex evolutionary relationships within and between species. What cue allows a newly colonised poisonous invader to evolve into prey for native predators? And to present a similar predation pattern as that of the distant native range. It is a fascinating eco-evolutionary question. The Formosa Kukri Snake (*Oligodon formosanus*) is renowned for its distinctive curve and sharp rear maxillary teeth (Mori et al., 1992; Coleman et al., 1993) and specialises in feeding on reptilian eggs (Ota and Lin, 1994). It plays a crucial role in intraspecific competition (Huang et al., 2011), adaptation, and coevolution with local fauna (Pike et al., 2016) on Orchid Island, an offshore island of southeastern Taiwan. An ongoing decline in sea turtle nests and eggs, which influences the ovivory of the Formosa Kukri Snake, is altering and shaping this islet's reptile fauna (Lin et al., 2023).

We observed a predation event on 13 November 2025, at around 16:12 hrs, at the trail to Beauty Cave, Sanfu Village (22.35294° N, 120.378596° E; 30 m elevation), Little Liuqiu Island (also known as Xiaoliuqiu Island or Lambai Island), southwest offshore of Taiwan. A struggling Banded Bullfrog, *Kaloula pulchra* Gray, 1831, (ca 5 cm in snout-vent length, SVL) was being subdued and eviscerated by a Formosa Kukri Snake (ca 40 cm SVL) (Fig. 1). The liver of the bullfrog was obviously exposed outside of its body cavity. The head of the snake was partially embedded and tried to enter the deeper part of the frog's body cavity while being

observed (Fig. 2). The observation lasted approximately 20 minutes, and then the observer (C-C T) departed. However, when the observer returned one hour later, the snake and bullfrog were gone.

Green Sea Turtle (*Chelonia mydas*) eggs are a major food source for the Formosa Kukri Snake population on some Taiwanese offshore islands. In contrast to the *C. mydas* population and density on Orchid Island, *C. mydas* densities on Little Liuqiu Island are larger (Fong et al., 2025). However, this does not mean that more turtles will land and lay eggs along the coast and



Figure 1. At first glance, a Formosa Kukri Snake has subdued a banded bullfrog on the trail to Beauty Cave, Little Liuqiu Island, southwest of Taiwan. Photo by Chun-Chi Tsai.

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Figure 2. When the victim banded bullfrog turned belly up with the partially exposed liver, the Formosa Kukri Snake attempted to embed its head in the frog's eviscerated chest. Photo by Chun-Chi Tsai.

beaches of Little Liuqiu Island (Fong et al., 2025), especially as intense recreational pressure increases during the sea turtle oviposition season. Compared to Orchid Island (45 km²), Little Liuqiu Island (6.8 km²) is a smaller, more densely populated islet with less diverse oviparous reptile fauna. Survival pressure might cause the Formosa Kukri Snake to seek more suitable prey, and thereby predated on invasive species.

Bringsøe et al. (2021) also report on a predation event of a Banded Bullfrog by a Formosa Kukri snake, however, their observation occurred in Hong Kong where both species are native species that have coexisted and interacted in their natural environment for an extended period. The Banded Bullfrog is an invasive

species in Taiwan, first identified in Kaohsiung, southern Taiwan, in 1997 (Lin, 2007). According to observations on the iNaturalist platform, the first sighting of this species on Little Liuqiu Island was on 18 November 2020 (iNaturalist, 2025). What signals and mechanisms do Banded Bullfrogs have to become a food source for the Formosa Kukri Snake? Does the terrestrial and burrowing Banded Bullfrog possess repelling or attracting chemical cues on its body? It is unknown whether the Formosa Kukri Snake on Little Liuqiu Island also predated on the native *Duttaphrynus melanostictus*, given it is predated on by *O. fasciolatus* in Thailand (Bringsøe et al., 2020) and *O. ocellatus* in Vietnam (Bringsøe and Holden, 2021). Further survey efforts and research are necessary.

Acknowledgments. We thank Dr. Shan-Dar Tao (Biology Department, National Museum of Natural Science, Taiwan) for pre-reviewing this note before publication.

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