

In situ parental observation of male *Limnonectes leytensis* eggs in Sambonotan Watershed, Dinagat Islands, Philippines

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Subject identified by: Arvin C. Diesmos, Rafe M. Brown.

Location: Sambonotan Watershed, Barangay Mabini, Municipality of Tubajon, Dinagat Islands, northeastern Mindanao, Philippines (N10°19.29' E125°36.45'; WGS 84).

Elevation: 69 metres ASL.

Habitat: Mature, secondary growth, lowland forest.

Date and time: 12 November 2018, 14:30 hrs.

Identity of subjects: Leyte Swamp Frog (Leyte Wart Frog), *Limnonectes leytensis* (Amphibia: Anura; Dicroglossidae)

Description of record: During a herpetofaunal survey in Sambonotan Watershed, we observed a clutch of eggs of Leyte Swamp Frog *Limnonectes leytensis*. (Fig. 1). A total of 98 eggs in a single clutch of *L. leytensis* were counted, situated along an obliquely-angled wood vine, which were encapsulated in a 4 mm thick, dense, transparent jelly-like envelope approximately 7.0-7.5mm across and in a stage-22 of an egg-adult formation of frogs (Gosner, 1960). Tail buds were clearly visible with progressive neural formation and development of other differentiated body parts including the head, which is prominent in a pale-yellow colouration and with different patterns of pigmentation.

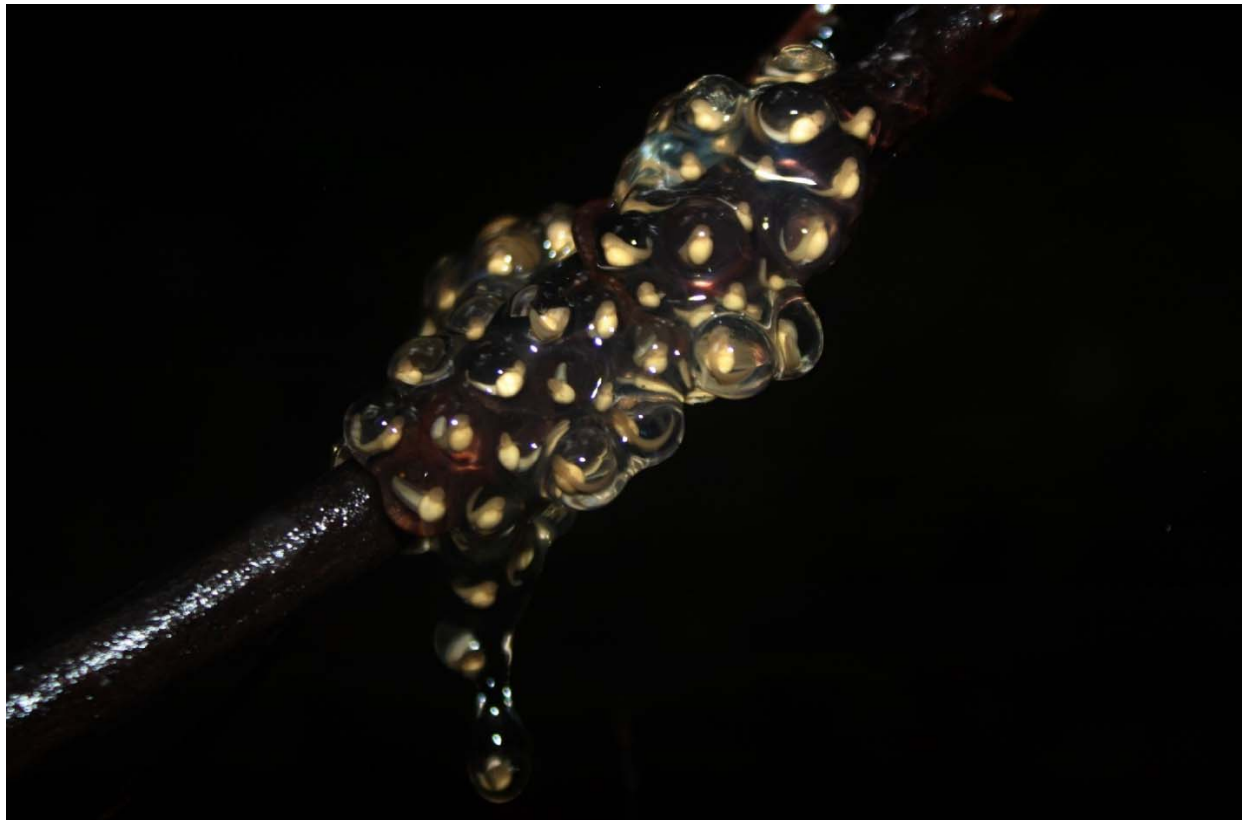


Fig. 1. *L. leytensis* eggs in situ

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An adult male *L. leytensis* (snout-vent-length: 29.4 mm) was observed clinging to a wood vine 13 cm beneath the clutch of eggs, and 56cm above a clear pond of water (20 cm in depth, pH = 6.0), and 2 metres from a nature trail (Fig. 2). The frog appeared to be safeguarding the eggs against natural predators. The habitat in the area (Fig. 3) is composed of re-growing dipterocarp forest with dense understory vegetation, and a forest floor dominated by leaf litter in a slightly mineralized, reddish, clay-loam soil (pH = 5.1). The forest was relatively humid (RH = 98%) with an air temperature range of 26.0-27.6°C, which potentially maintains the moisture of the environment and prevents dehydration of the eggs.



Fig. 2. Adult male *L. leytensis* perched on diagonal wood vine

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Fig. 3. *L. leytensis* eggs hanging on wood vine in mature secondary forest.

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Remarks:

The Leyte Swamp Frog *Limnonectes leytensis* is a Philippine endemic fanged frog, formerly known as *Rana microdisca leytensis* (Inger, 1954). It is a medium-sized frog with (i) a fang-like odontoid process on the lower jaw, (ii) smooth dorsal skin, (iii) tympanum hidden on a dorsal edge, (iv) presence of irregular dorsal fold ridges and (v) a prominent supratympanic fold (Siler et al. 2009; McLeod, 2010).

It is known to occur on the islands of Leyte, Samar, Bohol, Camiguin Sur, Cebu, Negros, Mindanao, Romblon Island Group, Basilan, Sulu Archipelago and Dinagat (Siler et al. 2009; Diesmos et al. 2015; Sanguila et al. 2016) and is mostly found in swamps, streams and riparian areas in primary and secondary forest habitat.

Fanged frogs have a unique parental behavior wherein most of its male individuals invest parental care, rather than its females (Vallejos et al. 2018). This includes guarding of terrestrial eggs, transporting of tadpoles on the back and flanks and carrying developing tadpoles in the vocal sacs (Iskandar et al. 2014). Male parental care of Philippine fanged frogs is quite uncommon or undocumented. Nevertheless, it is widespread and potentially plays an important role in the success and survival of the species throughout the clade in Southeast Asia.

To the best of our knowledge, there are no published accounts on the Philippine *Limnonectes* group that demonstrates male parental behavior and displays exceptional nesting clutch placement. Our field observations provide new information on male parental care, clutch size and nesting site preference of *L. leytensis* in the Dinagat Islands.

Note: No voucher specimens were collected. Images shown here were deposited at the digital archive of the Lee Kong Chian Natural History Museum, National University of Singapore (NUS) and are permanently cataloged (Code: ZRC, IMG 1.183-1.184).

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