

Biodiversity Record: Agonistic behaviour of Malesian frogs, *Limnonectes malesianus*

Chen Xuanhe

Email: xuanhezen@gmail.com

Recommended citation. Chen X (2026) Biodiversity Record: Agonistic behaviour of Malesian frogs, *Limnonectes malesianus*. Nature in Singapore, 19: e2026083. DOI: 10.26107/NIS-2026-0083

Subjects: Malesian frog, *Limnonectes malesianus* (Amphibia: Anura: Dicroglossidae).

Subjects identified by: Chen Xuanhe.

Location, date and time: Singapore Island, northeastern part of Central Catchment Nature Reserve; 11 June 2026; 2010–2200 hrs.

Habitat: Edge of freshwater swamp forest. On leaf litter substrate with adjacent ephemeral puddles.

Observers: Chen Xuanhe and Gary Yap.

Observation: Three males of similar size (around 12 cm snout-vent length) were observed congregating, while a smaller female (around 10 cm snout-vent length) was in proximity, about 1.5 m away. Two of the males then began taking turns to emit low-frequency calls with inflated throats, while elevating their puffed bodies on stretched-out limbs (Fig. 1). The calls of the frogs during the interaction resemble a series of continuous rattles, which are unlike the single croaking that is recognised as the species' distress call (Herpetological Society of Singapore, 2021). The two male frogs then proceeded to suddenly lunge and bite onto each other's head, flank or hind legs (Figs. 2 & 3). Attempts at flipping were observed, while other attempts ended in biting stalemates before a brief disengagement. The entire process was repeated throughout the duration of the observation. The third male frog joined in the fight at 2037 hrs, when he bit onto one of the attacking male's hind legs (Fig. 4). A fourth male was sighted when revisiting the site at 2139 hrs. The full duration of this behaviour is unknown, but the frogs remained congregated at 2200 hrs when the observers left the site. The observation was made after a heavy rainfall.

A video recorded by Chen Xuanhe of the interactions of the three male frogs, including audio of the frogs' call, can be viewed at <https://youtu.be/TwfXEuuMUJM?si=eqjECrkVA5dRW6PO>.



Fig. 1. Lateral view of three male frogs standing-off, while emitting low-frequency calls, prior to fighting. Fig. One male frog clamping his jaws on the head of another during a fight. (Photographs by: Chen Xuanhe).

Remarks: The featured observation may be the first published record of agonistic behaviour in *Limnonectes malesianus*. It is highly likely that the individuals were engaging in male-male combat to secure the most desirable ephemeral puddle as breeding territory. The featured site is believed to be a mating ground for *Limnonectes malesianus*, as on a previous

occasion, a pair was encountered in amplexus (Fig. 5). Agonistic behaviour has previously been observed locally with black-eyed litter frogs, *Leptobrachium nigrops* (see Law & Serin, 2016).

In Singapore, *Limnonectes malesianus* largely inhabits streams and swampy areas of the Bukit Timah and Central Catchment Nature Reserves and the Western Catchment Area (Figueroa et al., 2023). It is considered nationally Near Threatened (Thomas et al., 2024).



Fig. 3. Two male frogs in combat with the individual at the rear clamping his jaws on his opponent's hind leg. Fig. 4. Three male frogs in battle with the individual on the right biting onto the head of one of his opponents, and apparently having his right leg caught in the jaws of the other opponent at the rear. (Photographs by: Chen Xuanhe).



Fig. 5. A pair of *Limnonectes malesianus* in amplexus on 17 December 2025. (Photograph by: Gary Yap)

Literature cited:

- Figueroa A, Low MEY & Lim KKP (2023) Singapore's herpetofauna: updated and annotated checklist, history, conservation, and distribution. *Zootaxa*, 5287: 1–378.
- Herpetology Society of Singapore (2021) *Limnonectes malesianus* (Malesian frog) distress call. Soundcloud. https://soundcloud.com/user-594921597/limnonectes-malesianus-release-call-edited?si=195f92966623471fb13a267baa981494&utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing (Accessed 12 June 2026)
- Law IS & Serin S (2016) Wrestling behaviour of black-eyed litter frogs. *Singapore Biodiversity Records*, 2016: 194–197.
- Thomas N, Law IS & Lim KKP (2024) Checklist of amphibian species with their category of threat status for Singapore. In: Davison GWH, Gan JWM, Huang D, Hwang WS, Lum SKY & Yeo DCJ (eds.) *The Singapore Red Data Book: Red Lists of Singapore Biodiversity*. Third edition. National Parks Board, Singapore, p. 671.