

Likely scavenging on an adult Fujian Large-headed Frog, *Limnonectes fujianensis* Ye & Fei, 1994, by a fly larva in Taiwan

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The deterioration of suitable habitat often reduces ecological divergence between species. Forcing species to coexist within a confined environment thus increases interactions, such as predation (Ryall and Fahrig, 2006) and competition (Millette et al., 2020), and can even mediate the extinction of prey species under certain circumstances (Ryall and Fahrig, 2006). The Fujian Large-headed Frog (*Limnonectes fujianensis*) is a small- to medium-sized frog (maximum SVL 57.9 mm in females, and males can be 1.06 times larger than females; Tusji and Lue, 2000) widely distributed in habitats below an elevation of 1000 m in Taiwan. The female of this species is reported to return to specific microhabitats during the non-reproductive season (Tusji and Lue, 1998, 2000).

We made our observation on 25 December 2025 around 21:00 h at our field site in Taomi, Nantou, central Taiwan (23.9471°N, 120.9096°E, elevation 450 m). This area includes a very small creek with rocky or partly muddy substrate, surrounded by cultivated bamboo and secondary forest. The creek feeds more than a dozen small ponds that serve as our field sites for monitoring the movement and reproduction of *L. fujianensis*.

During harmonic radar telemetry surveys to map the spatial use by *L. fujianensis*, we found an insect larva trying to drag the corpse of a frog back to its hiding place. The larva immediately dropped its prey when our headlamp illuminated the pond. After about 20 min, we finished our survey work and left the place and waited around 2m away from the pond for around ten minutes for another round of observation. The larva reemerged

and continued trying to secure its prey (Fig. 1). The frog was a female *L. fujianensis* that had been microchipped (ID 150940). Our protocol includes three rounds of telemetry survey, and since the frog was not observed during the first two rounds, and since the frog was not observed during the first two rounds, it must have died within an hour of the observation. However, whether the larva directly caused the frog's death or whether other factors killed the frog and the larva scavenged on the deceased frog remains unclear.

Based on its morphology, it is very likely that the larva belonged to one of the two subfamilies of the Family Corydalidae, the dobsonflies (Corydalinae) or the fishflies (Chauliiodinae). The larvae of these types of flies are omnivorous, generalist predators and scavengers (Rivera-Gasperin et al., 2019). They are mainly ambush foragers but sometimes also actively search for prey (Hayashi and Nakane, 1989). In this insect family, prey selection is usually closely related to the maximum size of mandibles (Hayashi, 1988). In the case of larvae of the dobsonfly *Protothermes grandis*, these feed year-round, even during winter (Hayashi and Yoshida, 1987). Although they occasionally scavenge and cut their prey with their mandibles, it appears to be unusual for a larva to kill and prey on an adult frog as large or larger than its own body.

We observed that the water level in this creek drops significantly during winter, when the observation was made. The total water volume decreased by 79.1% from July (2.96 m³) to December (0.62 m³), indicating a continuous drying trend over a six-month period. Among the 16 ponds we surveyed, one dried out in August and five others (8, 9, 14–16) dried out from October–December. We also noted that the frog's body weight had decreased steadily. From October until 22 December, three days before its death, its weight had declined from 10.23 g to only 7.25 g, a loss of nearly 30% of its body weight. It is unlikely that the loss of body weight was caused by reproductive efforts because no reproduction

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Figure 1. A fly larva seen in the process of scavenging on the body of a dead Fujian Large-headed Frog and move it back to the hiding location (Photographer: Min-Hao Hsu).

had been recorded since October. However, it is possible that weight loss, from whatever factors, would weaken the frog and make it more vulnerable to predation by an insect larva. Additionally, the low water level may force the aquatic predator to prey on an unusual organism.

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