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A rare record of a midge biting *Nidirana shyhhuangi* Lin et al., 2025 in Taiwan

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In recent years, amphibian declines have become a well-publicised phenomenon (Luedtke et al., 2023). Pathogens and parasites have been reported as important contributors to this trend (Daszak et al., 2003). For amphibians, hematophagous arthropods have been considered potential secondary hosts that may transmit pathogens among hosts (Ramos and Urdaneta-Morales, 1977). Therefore, understanding the interactions between amphibians and hematophagous arthropods is essential for evaluating the potential risk of disease transmission.

Nidirana shyhhuangi Lin et al., 2025 (Anuran, Ranidae), commonly known as the "Yuchi Music Frog", is an endemic frog species in Taiwan. This species was regarded as conspecific with *N. okinavana* until 2025, when it was finally described and recognised as one of the most endangered amphibians in the world (Lin et al., 2025). *Nidirana shyhhuangi* is currently known only from the Yuchi Township of Nantou County. This extremely narrow distribution and likely small population size is of concern given extreme climate events, habitat degradation or other ecological effects such as inbreeding depression. Here, we report the first record of *N. shyhhuangi* being bitten by a frog-biting midge (Diptera, Corethrellidae), indicating a potential risk of disease transmission to this species.

Corethrellidae, a monotypic family commonly known as frog-biting midges, are a widespread group of hematophagous insects that have only been reported to feed on anurans (Borkent, 2008). Female frog-biting midges use frog calls as cues to locate their hosts, which are typically male frogs during the breeding season (Legett et al., 2018). Frog-biting midges have been found to carry the lethal Bd chytrid fungus DNA in the wild, raising concerns that these insects may transport zoospores between amphibian hosts. (Toledo et al., 2021). Research on frog-biting midges in Taiwan is limited, with *Corethrella nippon* Miyagi, 1980 being the only species reported so far (Lien, 1998). In recent years, host-preference tests of Corethrellidae species have become a popular topic. For *C. nippon*, Bang et al. (2025) and Toma et al. (2019) independently tested host preference in Taichung City, Taiwan, and the Ryukyu Archipelago, Japan. However, the mating calls of both *N. okinavana* and *N. shyhhuangi* were not included in these studies. During the breeding season, male *N. shyhhuangi* exhibit nidification behaviour: they construct mud burrows and call from within to attract females. Because of this unique behaviour, it is difficult to observe calling males of *N. shyhhuangi* in the wild, as well as their intraspecific interactions with frog-biting midges and other hematophagous insects.

During a field survey on 14 September 2025, we encountered a male *Nidirana shyhhuangi* calling in a pond located at the Lienhuachih Research Center of the Taiwan Forestry Research Institute (23.9188°N, 120.8827°E). During the observation, we noticed a small insect biting the frog's back (Fig. 1A). When the insect left the frog, we captured it with an Eppendorf tube and preserved it in 95% ethanol. Back in the laboratory, we identified the insect as *Corethrella nippon* based on its plain, unpatterned wings and the colouration of the scutum (Borkent, 2008) (Fig. 1B). The specimen of *C. nippon* is now preserved in the NCHU Museum of Natural History (Collection ID: NCHU-25001). This finding not only demonstrates that *N. shyhhuangi* can serve as a blood source for hematophagous insects, but also highlights the potential risk of disease transmission between *N. shyhhuangi* and other amphibians.

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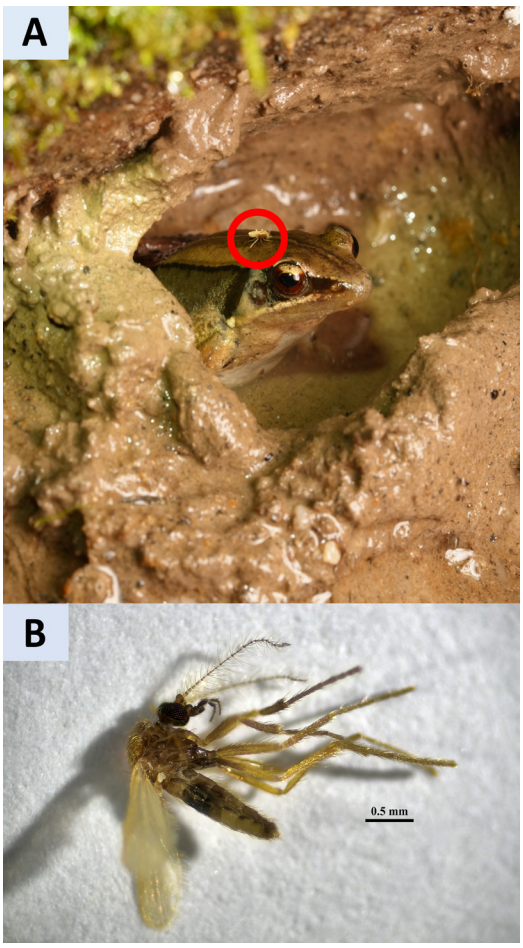

Figure 1. (A) A frog-biting midge (*Corethrella nippon*) (Red circle) feeding on a Yuchi Music Frog (*Nidirana shyhhuangi*) from its back. (B) The *Corethrella nippon* specimen of this record. Photos by Jh-Yu You.

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