



Necrophilia in Himalayan Toads, *Duttaphrynus himalayanus* (Günther 1864), from Eastern Nepal

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The Himalayan Toad (*Duttaphrynus himalayanus*), one of three Nepalese bufonids, is distributed from western to eastern Nepal at elevations of 1,300–2,700 m (Kästle et al. 2013). Breeding sites consist of stagnant waters that are exposed to sun, brooks, ponds in pastures, and ephemeral puddles (Schleich and Kästle 2002; Kästle et al. 2013). Necrophilia, also known as necrophiliac behavior, Davian behavior, thanatophilia, and necrogamy, is a reproductive behavior that involves sexual interactions between living males and dead females or males (Dickerman 1960; Pintanel et al. 2021). Intra- and interspecific necrophilia has been reported in 32 anuran and one caudate species (Pintanel et al. 2021). Most recently, necrophilia has been recorded in the Mexican Treefrog (*Smilisca baudinii*) from Mexico (Peralta-Hernández and Perea-Pérez 2021) and the toad, *Amazophrynella teko*, from northern Brazil (Costa-Campos et al. 2021). Herein I report the first record of necrophilia in *Duttaphrynus himalayanus*.

At 1230 h on 14 March 2022, I observed necrophiliac behavior in Himalayan Toads in Hanspokhari, Rong Rural Municipality, ward number 3, Ilam District in eastern Nepal (26°49'45.0"N, 88°04'43.7"E; 1,625 m asl). Ambient and water temperatures were 36.5 °C and 21.3 °C, respectively. In addition to the three males in amplexus with the dead female (Fig. 1), I observed seven pairs of *Duttaphrynus himalayanus* in amplexus. Hanspokhari and the surrounding forest support a rich amphibian fauna, providing habitat for the Nepal Flying Frog (*Zhangixalus smaragdinus*), Annandale's Bush Frog (*Raorchestes annandalii*), the Chunam Frog (*Polypedates maculatus*), the Mahabharat Torrent Frog (*Amolops mahabharatensis*), and the Himalayan Salamander (*Tylototriton himalayanus*) (Rai 2011). As the Mechi Highway runs adjacent to Hanspokhari, the site is easily accessible to visitors and amphibians are vulnerable to road mortality from vehicles. At present, this region is being developed as a popular recreational area with a small market and pathway through the forest that leads to the Pathivara Temple at the top of a hill.

Breeding male anurans often fail to discriminate between receptive conspecific females and males, spent females, males and females of other species, or even inanimate objects (Duellman and Trueb 1986). So, the event depicted herein might reflect no more than a lack of discrimination by the males involved. However, due to the presence of a string of eggs, this mating might initially have been successful until the female became exhausted and drowned as a consequence of prolonged fighting by competing males, thus leading to necrogamy. In either case, the burned venter of the dead female indicates that she had succumbed several hours earlier.

Because individual males might lose the opportunity to reproduce successfully, necrophilia has been considered



Fig. 1. Three male *Duttaphrynus himalayanus* in amplexus with a dead conspecific female in Hanspokhari, Ilam, eastern Nepal. Photograph by Tapil Prakash Rai.

a maladaptive behavior (Ayres 2010). It also could result in an increased risk of predation (Carmona-González et al. 2020), an increase in road fatalities (Patel et al. 2016), or even propagation of potentially serious infections (Beebee 2012). However, some authors (Izzo et al. 2012; Groffen et al. 2019) have suggested that necrophilia may improve reproductive success in some amphibian populations with male-biased sex ratios because, if a female dies, the low probability of a male finding another partner makes fertilization of oocytes from the dead female genetically beneficial for the entire population. However, in the situation described herein, that two males lost an opportunity to reproduce and the chance of transmitting an infection from the wound on the venter of the dead female would suggest that this event was counterproductive.

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