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SHORT COMMUNICATION

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A new record of karstic limestone cave dwelling odorous frogs *Odorrana* sp. from western Guizhou

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Southern China is one of the diversity hotspots for odorous frogs (*Odorrana* spp.), a genus with a wide distribution in south-east Asia (Frost et al., 2024). Currently, there are 66 described species within the genus and of the 43 known from China, 28 are endemic (Frost et al., 2024). Guizhou province, located in south-western China, is known for its high species diversity due to the karstic mountain formations, limestone caves, and its role as a refuge from Quaternary glaciation events (Jiang et al., 2022). These characteristics provide a variety of microhabitats that are ideal for endemism and speciation. It is no wonder that new species, such as those from *Odorrana* have been described from this region as recently as 2024 (Li et al., 2024).

Most species of *Odorrana* inhabit high-gradient mountain-streams (Li et al., 2024), although several taxa have been found to inhabit karstic limestone caves. These include - *Odorrana lipuensis* which is known exclusively from the dark karstic limestone caves of eastern Guangxi, China (Mo et al., 2015); *Odorrana liboensis* known only from the dark karst cave of Maolan National Nature Reserve, Libo County, Guizhou province, China (Luo et al., 2021); and *Odorrana wuchuanensis* known to occur with a restricted distribution in dark caves in southern Guizhou to northern Guangxi, northern Guizhou in Wuchuan county and Hubei (IUCN, 2020; Wu, 1983).

While hiking in the karstic mountains near Xiabacun, Xixiu District, Anshun, Guizhou, I encountered individuals of the genus *Odorrana* twice within the limestone caves on these mountains and photographed them (Sony α-6400 with FE 2.8/50 macro lens). The first encounter occurred at 16:00 h on 4 October 2024, in a small limestone cave, with a water condensation stream in south-east of Xiabacun (26° 9’32.594” N, 105° 52’51.862’ E, altitude 500 m). The path to the cave entrance was modified with concrete stairs and wooden fencing up to the cave. The cave is heavily disturbed by humans, a path has been dug into the floor of the cave and loose pieces of sedimentary rock, dirt and trash were present within the cave. Upon entering the dark cave, three juvenile frogs were found on the ground on the dirt path, there were two brighter green ones and one darker green individual, each had black spotting on their backs and sides, with banding on arms and legs (Fig. 1). They scattered in reaction to torchlight and hid under loose rocks.

The second encounter occurred at 14:50 h on 7 October 2024, in a cave on the mountains of Xiabacun, Xixiu District, Anshun, Guizhou (26° 9’32.594” N, 105° 52’51.862’ E, altitude 500 m). Two adult *Odorrana* sp, in amplexus with the male positioned on top of the female, were spotted next to a large lake within a large karstic limestone cave in complete darkness; fish and crayfish were also observed within the lake. The cave and lake contained many loose rocks and litter resulting from human activity (Fig. 2). The male (around 10 cm) was smaller than the female (around 12 cm) (Fig. 2). In reaction to torchlight, the female frog remained still but upon being disturbed it jumped into the water and swam under a rock. I left the area but returned soon after, by which time the pair was back on land.

Figure 1. Three juvenile *Odorrana* sp. encountered within a cave, the bottom right photo shows the dark cave habitat where they were found

These frogs were observed in habitats that have been disturbed by human activity. As Guizhou develops and opens up to further tourism, it is paramount that we understand the diversity of potentially sensitive and endemic species, so that proper management and protection can be employed before it is too late. Both sightings were made in caves that were geographically close to each other. *Odorrana* is a particularly diverse genus in southern China so there are likely to be many more populations and perhaps new species that are in need of protection.

These sightings likely represent the first report of *Odorrana* in the karstic mountains of Anshun in western Guizhu. Although locals who frequent these limestone caves have seen and known about them, their presence has not been

Figure 2. Cave dwelling adult *Odorrana* sp. in amplexus (above) and the large cave with a lake in complete darkness (below), where they were living

reported online or in the scientific literature. The unusual cave dwelling habit of these frogs suggests that they may be a new species of cave dwelling *Odorrana* or alternatively they may be a new population of *O. wuchuanensis*. In the latter case, this would extend the range of this protected species, as the distribution of *O. wuchuanensis* is patchy with populations known from Hubei, Guizhou, to northern Guangxi. Accurate identification would require genetic sequencing, phylogenetic and phenotypic analysis. Future studies should be undertaken to sample the population of these cave dwelling frogs around Anshun, Guizhou, to fully understand the range, population, natural history, and identity of these frogs.

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