



# Mushroom Sprouting out of a Living Frog

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Rao’s Intermediate Golden-backed Frog, *Hylarana intermedia* (Rao 1937), is endemic to the Western Ghats of Karnataka and Kerala, India, above the Palghat Gap, where it is found in relative abundance (Biju et al. 2014).

At 1230 h on 19 June 2023, at Mala, Karkala, Karnataka, India (13.380833 N, 75.226667 E), in the foothills of the Kudremukha Ranges, we encountered about 40 Rao’s Intermediate Golden-backed Frogs in a small roadside rain-



**Figure 1.** A Rao’s Intermediate Golden-backed Frog (*Indosylvirana intermedia*) with a Bonnet Mushroom (*Mycena* sp.) sprouting from its left flank found on 19 June 2023, at Mala, Karkala, Karnataka, India. Photographs by Lohit Y.T.

water-fed pond. One individual perched on a twig had a distinct outgrowth on its left flank. A closer examination clearly revealed a mushroom sprouting from its side (Fig. 1). The frog was alive and moving. Mycologists later identified the mushroom to be a Bonnet Mushroom (*Mycena* sp.), which is known to be saprotrophic and occurs mostly on rotting wood.

Fungi are extraordinary organisms. They are generally saprotrophs or symbionts that facilitate nutrient cycling but many are parasites of plants and animals. In amphibians, the fungus *Batrachochytrium dendrobatidis* is known to cause the disease chytridiomycosis, which has affected more than 700 species of amphibians across the world (Berger et al. 1998; Longcore et al. 1999; Lips et al. 2006; Fisher et al. 2020). Recent studies have shown that this amphibian killer is present in low levels in all of the frog hotspots across India (Mutnale et al. 2018).

To the best of our knowledge, never has a mushroom sprouting from the flank of a live frog been documented. The frog was not collected, so no prognosis is possible.

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#### Literature Cited

- Berger, L., R. Speare, P. Daszak, D.E. Green, A.A. Cunningham, C.L. Goggin, R. Slocombe, M.A. Ragan, A.D. Hyatt, K.R. McDonald, H.B. Hines, K.R. Lips, G. Marantelli, and H. Parkes. 1998. Chytridiomycosis causes amphibian mortality associated with population declines in the rain forests of Australia and Central America. *Proceedings of the National Academy of Science USA* 95: 9031–9036. <https://doi.org/10.1073/pnas.95.15.9031>.
- Biju, S.D., S. Garg, S. Mahony, N. Wijayathilaka, G. Senevirathne, and M. Meegaskum. 2014. DNA barcoding, phylogeny and systematics of Golden-backed frogs (*Hylarana*, Ranidae) of the Western Ghats-Sri Lanka biodiversity hotspot, with the description of seven new species. *Contributions to Zoology* 83: 269–335. <https://doi.org/10.1163/18759866-08304004>.
- Fisher, M.C. and T.W.J. Garner. 2020. Chytrid fungi and global amphibian declines. *Nature Reviews Microbiology* 18: 332–343. <https://doi.org/10.1038/s41579-020-0335-x>.
- Lips, K.R., F. Brem, R. Brenes, J.D. Reeve, R.A. Alford, J. Voyles, C. Carey, L. Livo, A.P. Pessier, and J.P. Collin. 2006. Emerging infectious disease and the loss of biodiversity in a Neotropical amphibian community. *Proceedings of the National Academy of Science of the United States of America* 103: 3165–3170. <https://doi.org/10.1073/pnas.0506889103>.
- Longcore, J.E., A.P. Pessier, and D.K. Nichols. 1999. *Batrachochytrium dendrobatidis* gen. et sp. nov., a chytrid pathogenic to amphibians. *Mycologia* 91: 219–227. <https://doi.org/10.2307/3761366>.
- Mutnale, M.C., S. Anand, L.M. Eluvathingal, J.K. Roy, G.S. Reddy, and K. Vasudevan. 2018. Enzootic frog pathogen *Batrachochytrium dendrobatidis* in Asian tropics reveals high ITS haplotype diversity and low prevalence. *Scientific Reports* 8: 10125. <https://doi.org/10.1038/s41598-018-28304-1>.