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Journal of Threatened Taxa

10.11609/jott.2023.15.3.22771-22926

www.threatenedtaxa.org

26 March 2023 (Online & Print)

15(3): 22771-22926

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)



Open Access





ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

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Cover: Green Bee-eater with colour pencils and watercolor wash by Elakshi Mahika Molur.



New distribution record of *Roridomyces* cf. *phyllostachydis* (Agaricales: Mycenaceae), a bioluminescent fungus from Namdapha National Park, Arunachal Pradesh, India

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Bioluminescence is the biochemical reaction in living organisms where chemical energy from a complex compound such as luciferin is converted to light energy through oxidation under the action of luciferase which acts as a catalytic enzyme (Pandey & Sharon 2017). The phenomenon of bioluminescence is randomly reported across 17 phyla and more than 700 genera, both in marine and terrestrial environments (Lee 2015). Bioluminescence in fungi has been observed globally across several species belonging to four distinct monophyletic lineages, namely, *Armillaria* (Fr.) Staude, *Mycenaceae* Overeem, the *Lucipentes* lineage of *Mycena* (Pers.) Roussel s.l., and a lineage consisting of *Omphalotus* Fayod & *Neonothopanus* R.H.Petersen & Krisai (Matheny et al. 2006; Desjardin et al. 2008, 2010, 2016; Vydryakova et al. 2011; Aravindakshan et al. 2012; Chew et al. 2013, 2015; Shih et al. 2014; Mihail 2015;

Cortés-Pérez et al. 2019).

Being a biodiversity hotspot, India also hosts a variety of fungal species but the documentation on bioluminescent fungi is still deficient. Over the past few years, there have been a few reports on bioluminescence from fungi such as *Nothopanus eugrammus* and *Omphalotus olearius* (Vrinda et al. 1999), followed by a unique taxon from Kerala, *Mycena deeptha* (Aravindakshan & Manimohan 2014) & *Armillaria mellea* (Patil & Yadav 2022). Recently, a new species of bioluminescent fungi- *Roridomyces* cf. *phyllostachydis* (Karunarathna et al. 2020) has been described from Meghalaya (Mawlynnong in East Khasi Hills & Krang Shuri, West Jaintia Hills) respectively at altitude 560 m and 1021 m (Figure 1). In this article, we report the new distribution of *Roridomyces* cf. *phyllostachydis* (Agaricales, Mycenaceae) from Kamala

Editor: K.R. Sridhar, Mangalore University, Mangalore, India.

Date of publication: 26 March 2023 (online & print)

Citation: Dutta, A., S. Gupta, J.K. Roy & M.F. Ahmed (2023). New distribution record of *Roridomyces* cf. *phyllostachydis* (Agaricales: Mycenaceae), a bioluminescent fungus from Namdapha National Park, Arunachal Pradesh, India. *Journal of Threatened Taxa* 15(3): 22920–22923. <https://doi.org/10.11609/jott.8101.15.3.22920-22923>

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Funding: Re-wild, Aaranyak, and Durrell Wildlife Conservation Trust.

Competing interests: The authors declare no competing interests.

Acknowledgements: We are thankful to Re-Wild for funding a survey of 'Lost Species', the Namdapha Flying Squirrel which led to this observation in the field. We sincerely thank Samantha C. Karunarathna for providing valuable information for the identification of the species. We are grateful to the Forest Department, Arunachal Pradesh for their necessary permission (No: CWL/Gen/173/2018-19/Pt.IX/NG/ 393-401) and support. We sincerely thank our field assistants Mr. Aphu Yoha Yobin for their guidance in the field.



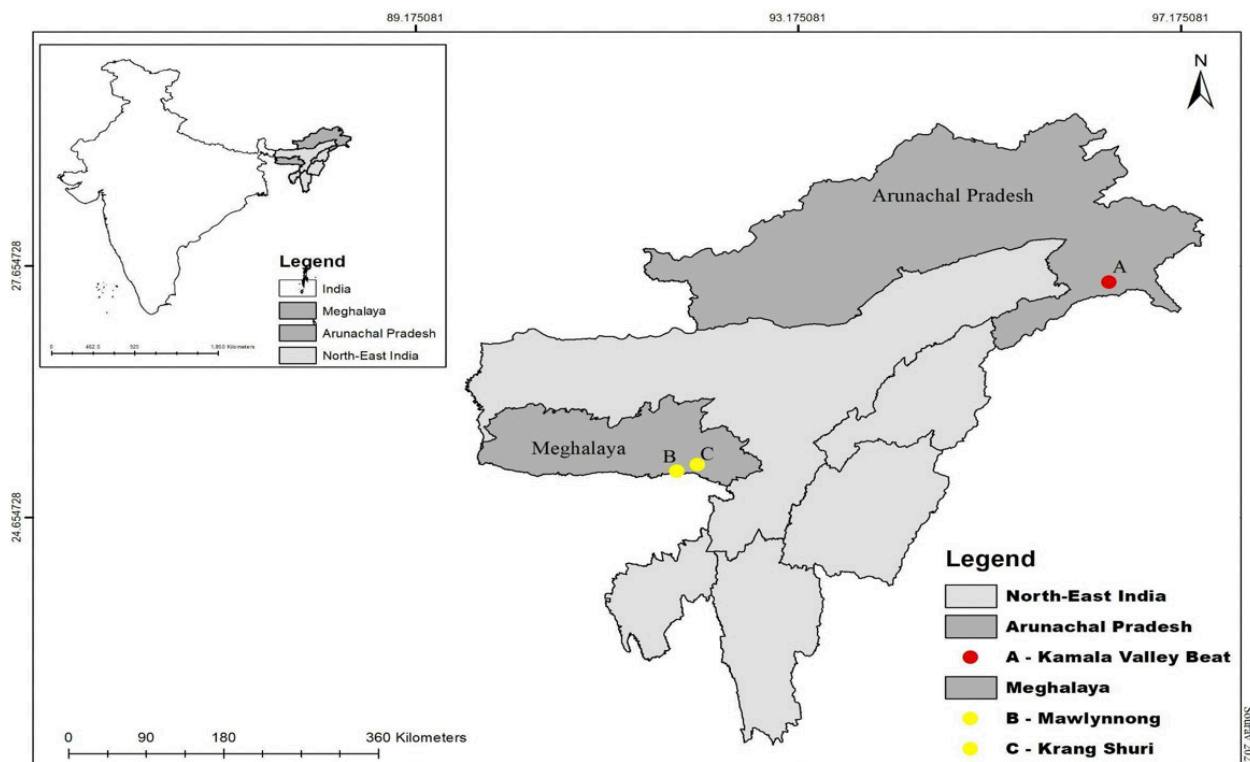


Figure 1. Distribution Map of *Roridomyces cf. phyllostachydis*: A—Shows the new distribution record from Kamala Valley beat, Namdapha National Park, Arunachal Pradesh | B & C—Showing the previous record from Mawlynnong & Krang Shuri, Meghalaya.

Valley Beat (27.462036°N, 96.426933°E, altitude, 611 m) in Namdapha National Park (NNP) (Figure 1), which is the easternmost national park, located in Changlang District of Arunachal Pradesh.

On 7 April 2022 around 19:35 hours, while conducting a nocturnal survey as a part of a study on small mammals, we opportunistically encountered a small glowing mass of *Roridomyces cf. phyllostachydis* by the side of the road on a wet muddy substratum. On further inspection, we noticed fresh fruiting bodies of the mushroom growing out, from the edge of a fragmented piece of dead, rotten bamboo belonging to the genus *Phyllostachys*, embedded in the soil. We were unable to determine the exact species of the host bamboo from the small fragmented piece. The surroundings were characterized by riparian vegetation consisting of short grasses, scattered with pebbles and ephemeral pools. On encountering the fungal species, we noted down the macro-morphological characters that were visible and photographs were taken in situ under both light and dark conditions (Image 1a).

The species was identified based on physical characteristics like small-sized, pileus 2.5 to 4.5 mm, obtusely conical, subumbilicate to umbilicate centrally depressed with pale brown striations in the middle;

decurrent and distant lamellae and central, cylindrical stipe with tapering at the pileus and slightly swollen at the base; pileus margin acute. Bioluminescence was only observed within the stipe, which emits bright luminous green light evenly in the dark (Image 1b,c). These morphological characters lead us to assign the observation as *Roridomyces cf. phyllostachydis*, later confirmed by one of the authors (Karunarathna S.C. pers. comm. 31 May 2022).

Earlier observation of *Roridomyces cf. phyllostachydis* showed its distribution to be gregarious and scattered, growing on dead bamboo sticks of *Phyllostachys mannii* (Karunarathna et al. 2020). Our observation also supports this description except that we found only a single group of fruiting bodies in the surveyed area. Previously there have been a few studies on the fungal species of Arunachal Pradesh (Sharma et al. 2015; Tabin et al. 2014) but to date, there is no record of any bioluminescent fungi from the state. Hence our observation of *Roridomyces cf. phyllostachydis* is the new distribution record from Namdapha, Arunachal Pradesh which is ~493 km (aerial distance) away from the previous record. There have been several hypotheses regarding the evolutionary significance of bioluminescence in fungi facilitating reproduction

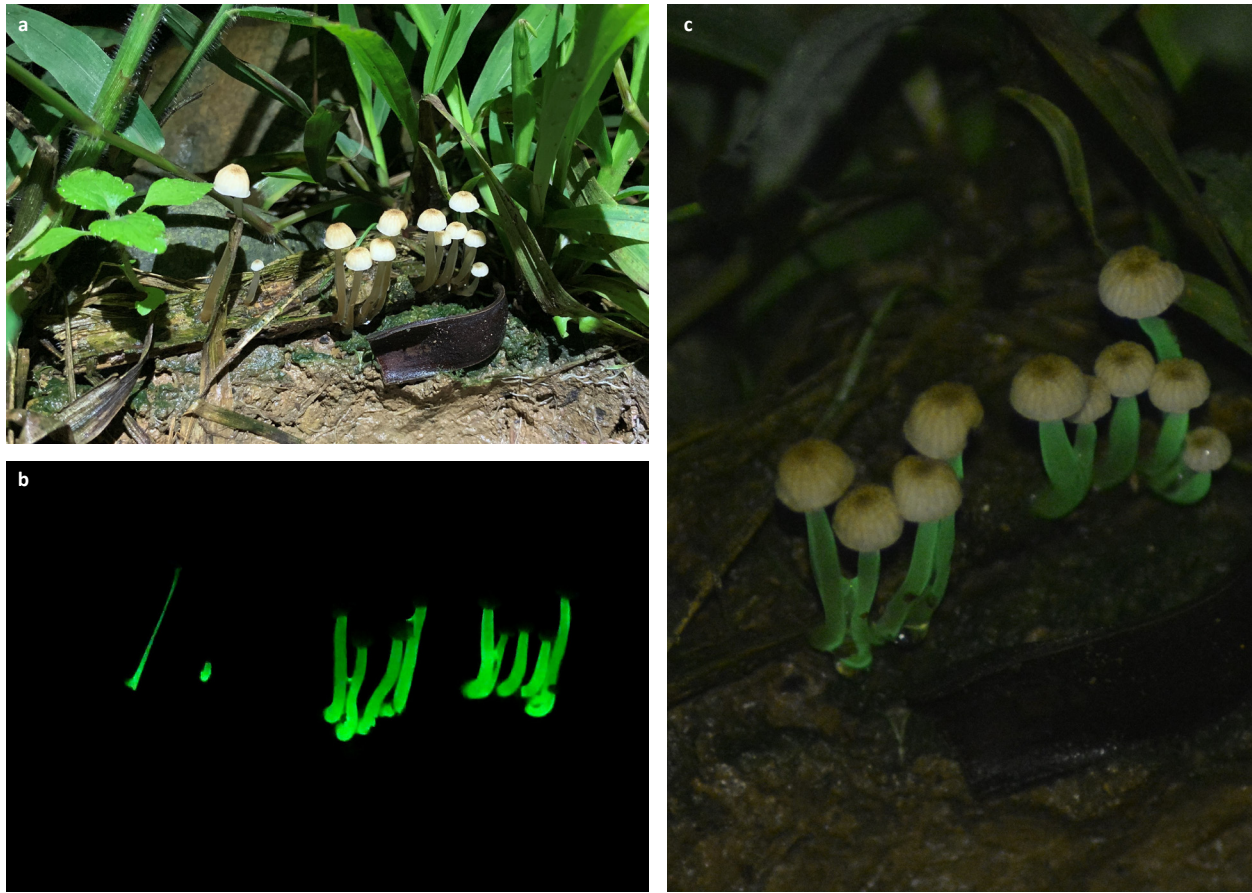


Image 1(a–c). Photographic evidence of *Roridomyces* cf. *phyllostachydis*: a—Habitat shot with fruiting bodies of *Roridomyces* cf. *phyllostachydis* on fragmented bamboo within a muddy substrate under the light | b—Stipes emitting bright luminous green light under complete darkness | c—Dorsal view of the pileus. © a & c—Sourav Gupta; b—Arijit Dutta.

by attracting insects for the dispersal of basidiospores (Bechara 2015) or as a defensive mechanism to reduce predation (Karunarathna et al. 2020; Dauner et al. 2021) but no thorough study has been conducted on its ecological effects. Hence our observation further demands more research on its ecological aspect and its effect on associated flora and fauna.

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Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
43/2 Varadarajulu Nagar, 5th Street West, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
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Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64



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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

March 2023 | Vol. 15 | No. 3 | Pages: 22771–22926

Date of Publication: 26 March 2023 (Online & Print)

DOI: 10.11609/jott.2023.15.3.22771-22926

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