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Cover: *Geodorum laxiflorum* Griff.—inflorescence (Orchidaceae) © Ashish Ravindra Bhojar.



Photographic record of *Armillaria mellea* a bioluminescent fungi from Lonavala in Western Ghats, India

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Bioluminescent organisms are one of the most distinctive creations of nature. Several groups of organisms exhibit luminescent properties such as animals, plants, fungi, and even bacteria (Pandey & Sharon 2017). The most commonly found bioluminescent organisms in the oceanic environment are Dinoflagellates (Fleiss & Sarkisyan 2019) while in terrestrial organisms bioluminescence has been observed in a wide range of organisms.

All bioluminescent fungi belong to the division Basidiomycota, except for one, *Xylaria hypoxylan*, which belongs to the Ascomycota division (Becker & Stadler 2021). Amongst this foxfire is a common name for different species of fungi like *Mycena chlorophos* and *Mycena citricolor* (Weitz 2004) while *Armillaria* (Basidiomycota, Physalacriaceae) species infects mostly woody species in natural forests (Baumgartner et al. 2011; Koch et al. 2017). *Armillaria* exhibits a wide range of hosts.

The *Armillaria mellea*, bioluminescent fungi contains an enzyme called Luciferase, causing luciferin substrate to catalyze in presence of oxygen. During these chemical reactions, products are released as excess energy, which is visible as light (Kaskova et al. 2017).

Earlier records suggest the presence of bioluminescent organisms from the Bhimashankar Wildlife Sanctuary in Maharashtra (Pal 2017). To explore the floral and faunal landscape, a survey was conducted from July to September 2021. The sites for the survey were Lonavala (18.694N, 73.386E) and Mulshi (18.459N, 73.406E) in Maharashtra. The survey was opportunistic and focused on the fauna and flora of northern Western Ghats.

The observations were made as the presence of luminescent fungi was seen on rotting substrates like branches, roots, and even leaves. During the day, the fungi appear yellowish-white in color as shown in the image, while at night, the fungi effuse green bioluminescence. During the survey, the observed fungus was noted, by its type of structure (Mushroom or sheet in form) and its presence in an area. During the survey luminescent areas were observed, marked, and documented. The fungi attracted and hosted small flies and insects during the observed period.

The fungus was identified based on the current literature available. The species is *Armillaria mellea*, also referred to as Foxfire or Fairy Fire or even as Wood Destroyer (Mishra & Srivastava 2021).

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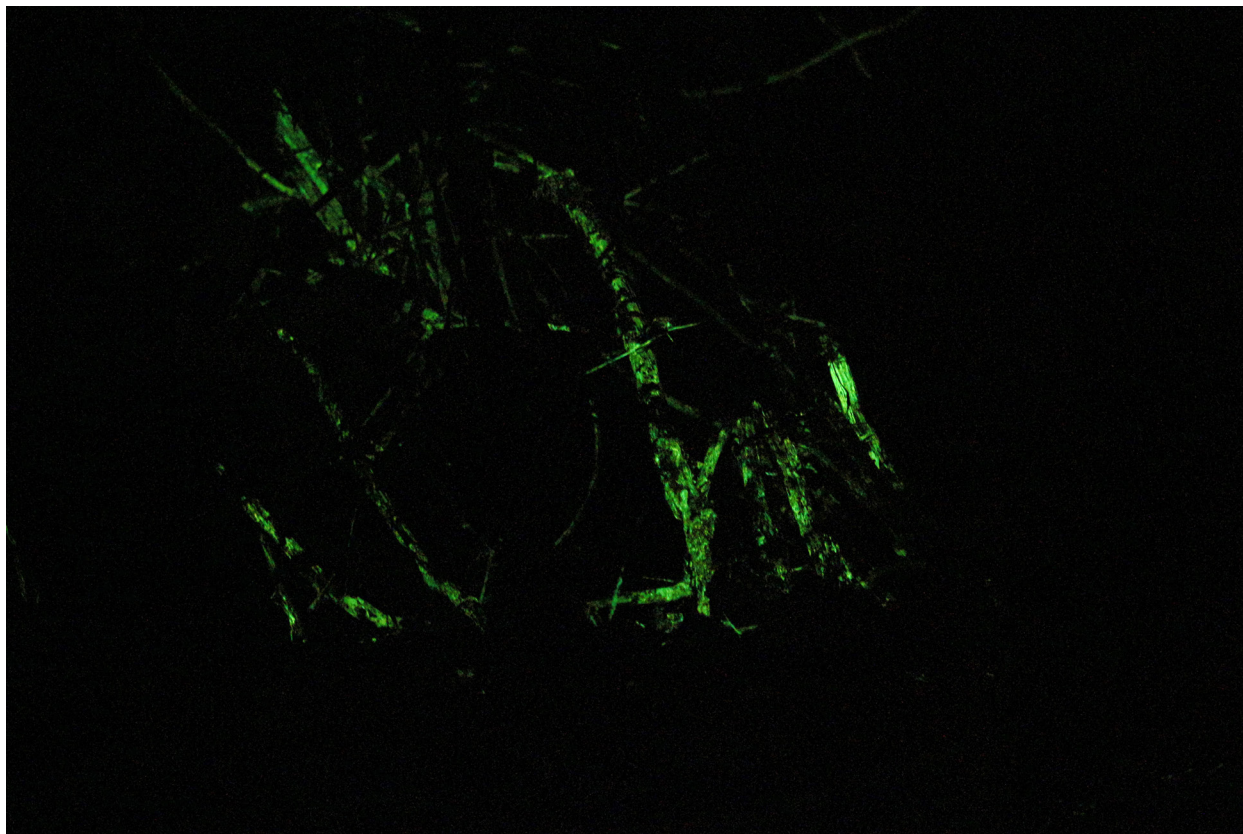


Image 1. Photographic evidence of glowing fungi during the night (bioluminescent fungi). © Arcane Conservancy.



Image 2. Yellowish-white patches on the dead branch is the bioluminescent fungi in light. © Arcane Conservancy.

The observed *Armillaria mellea* fungi were observed on the ground or on rotting on fallen wooden branches of trees. It emits a bluish-green glow and appeared to be abundant in the region. The team didn't come across any other type of bioluminescent fungi.

The functions of these fungi are still unknown. Studies (Fleiss & Sarkisyan 2019) suggest that the luminescent nature of these organisms is for spore dispersal mechanism for attracting insects.

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