

## Diversity of Aphyllophorales fungi from dang forest region of Nashik, Maharashtra, India

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### Abstract

The authors of the current study gathered a large number of fungal specimens from Nashik Dang Forest in the western ghat of Maharashtra and Gujarat. The goal of the current study is to map the variety and distribution of native Aphyllophorales in this forest, which is related to Karnjul, Surgana, Peth, Umbarthan, and Borgoan. The present study was conducted from July to October 2022, throughout the rainy and early dry seasons, samples were taken from both low and high altitudinal ranges. Various locations within the forest research area were examined and utilized to gather a variety of fungal specimens. The Aphyllophorales species viz. *Pinophora sp.*, *Ganoderma sp.*, *Hexagonia sp.*, *Microporus sp.*, *Phellinus sp.*, and *Flavolus sp.* were identified based on Macroscopic and microscopic features and use key for this identification. The early dry season saw the most abundance of species *Ganoderma* and *Microporous sp.* among these species. The study showed that the Aphyllophorales diversity has observed. The dang region required for conservation efforts, particularly for species that are edible and therapeutic.

**Key Words: Taxonomy, Aphyllophorales, Dang Forest, Nashik.**

### Introduction

Fungi are among the most important role in forest ecosystem, they have a positive or negative impact. Diverse kinds of fungi have been shown to grow and multiply in a range of climatic conditions (Blackwell, 2011) but also for their influence on humans and human-related activities (Mueller and Bills, 2004). They are used in the bioremediation of industrial waste and in the accumulation of heavy metals from the environment (Tuli et al., 2014). These fungi play vital role in the recycling of carbon due to their ability to degrade lingo-cellulosic substances of the wood. There are reports in literature about the use of fructifications of these fungi for curing many diseases (Dai et al. 2007; Song et al. 2008; Chen et al. 2016; Singh et al. 2016). Aphyllophorales has a great important role in pharmacology and medicinal ,it having biological active compounds helps on antitiditis, antiviral, antifungal disease (Zjawiony *et al.*, 2003). By using earlier literature for the details taxonomy studies of Aphyllophoarles specimens based on macro and micro-morphological characters (Singh & Bakshi 1961; Singh 1966; Bakshi 1971; Ryvardeen & Johansen 1980; Ding 1989; Roy & De 1996; Leelavathy & Ganesh 2000; Foroutan & Vaidya 2007; Bhosle et al. 2010; Ranadive et al. 2011; Sharma 2012; Ryvardeen & Melo 2014; Ranadive & Jagtap 2016; Kaur et al. 2017; Brar et al. 2018; Manoharachary et.al.2022, Vinjusha &Kumar2022).

In 2011 Ranadive published a Checklist of 170 Aphyllophorales species from Pune District, Maharashtra, that belong 86 Families was published (Ranadive *et al.*, 2011). After that in 2013 the detail studies on Aphyllophorales from western ghat of Maharashtra was conducted and published 110 taxonomies specimens of Aphyllophorales and released the results online Hakimi *et al.*, (2013). The diversity of Aphyllophorales from the Latur area were conducted by Chouse and Mali (Chouse *et al.*, 2020). Based on morphological and microscopic data, Gore and Mali investigated and published 37 species of Aphyllophorales from the Marathwada region (Gore *et al.*, 2021). The overall record from Maharashtra state only 6 district known to feature for Aphyllophorales flora and only 20.1% of the Aphyllophorales are found in various parts of Maharashtra, remain 84% diversity unexplored for the study. (Mali & Chaouse *et al.*, 2016).

### Materials and Methods

**Survey of study Area :** - Material was gathered from the Dang region, which is in the West Nashik District of Maharashtra State, India, and is located at 73053' and 53002' south and latitudes 20049' to 94'700 west. A number of Aphyllophorales fungi find Dang region to be one of the best environments.

**Collection of Sample:** - During the rainy season (month of June to July) and Early dry Season (month of October to November). The fresh fruiting bodies harvested from several locations inside the Dang Forest. A hand lens, forceps, sharp knife, and axe were used to collect the fruiting bodies of Aphyllophorales specimens.

**Photographic Documentation:** After The specimens were photographed in situ, using the Nikon camera (6X) equipped with Tokina 100 mm macro lens.

**Staining and mounting:** stained and studied in 10% KOH, Cotton Blue, and Melzer's reagent.

**Sample Identification:** - Microscopic examination of the specimens and optical microscopy observation of their spores, along with the use of keys from reference books (Sharama 2000 and Ryverden, 1980) and online databases (Indexfungorum and Mycobank), will be used for taxonomic identification of the sample. Each specimen was given a detailed description in terms of macroscopy and microscopy, which was then compared to published literature or the type material for identification (Ranadive *et al.*, 2012).

### Result and Discussion :

***Microporous xanthopus* (Fr.) Kunt. Rév. gen. Pl. 3:494, 1898.** Fruiting body is flattered, funnel shape, dark chocolate, stalk, solitary, annual to perennial, stalk is round, Pileus 5 to 9.5cm in diameter, 1.5mm thick. Context is yellowish, dark chocolate. Margin are entire thin, round, glabrous. Pore size is small, homogenous, size is 1-2 per mm. Mycelium are septate, trimetric, and generative hyphae with clamp connection. Basidiospore is amyloid, smooth.

***Pinopohra* sps (Fr.) Cooke 1879.** Fruiting body are sessile, resurpinate, corcacious annual to perennial, membranaceous. The Size of fruiting body is up to 9 cm X 4.2 mm thick. The Hymenial surface is smooth, occasionally cracked, and rose to pale pinkish grey. The margin is sterile, indistinct and is rose to pinkish grey. Hyphal system monomitic, generative hyphae with clamp connection. Basidiospores are ellipsoid, colorless, thin-walled.

### ***Trametes* sps (Berk) 1950.**

Fruiting body annual, Solitary, imbricate, confluent, attached with board base, often centrally stipites but growth not uniform, coriaceous while fleshy, hard, and pliable when dry, almost round to appanate. Pileus surface concentrically zone, white. The context is whitish with creamy, margin uneven, smooth, incurved. Homogenous towards margin, Pore angular, round when young. Hyphal system trimitic. Generative hyphae hyaline, thin slightly thick walled, septate with clamp connection.

### ***Hexagonia tenuis*, var. *tenuis* (Hook.) Fr. 1838**

Fruiting body is annual to perennial, solitary, flexible and leathery when dry. when fresh pileus sessile, fan shape flat. After dry cap are bent. The size of fruiting body is 6x3x2.2mm thick. pileus surface is scurfy, concentrically zoned in shades of pale brown yellow. Margin is thin, pointed, wavy, entire lobed. The surface of Pore is ashy bluish, pores shape is angular and hexagonal, variable. Tubes up to 1.1 mm long. Context are dark brown. Types of hyphae are generative, branched, thin walled clamed. Basidiospore are hyaline, cylindrical.

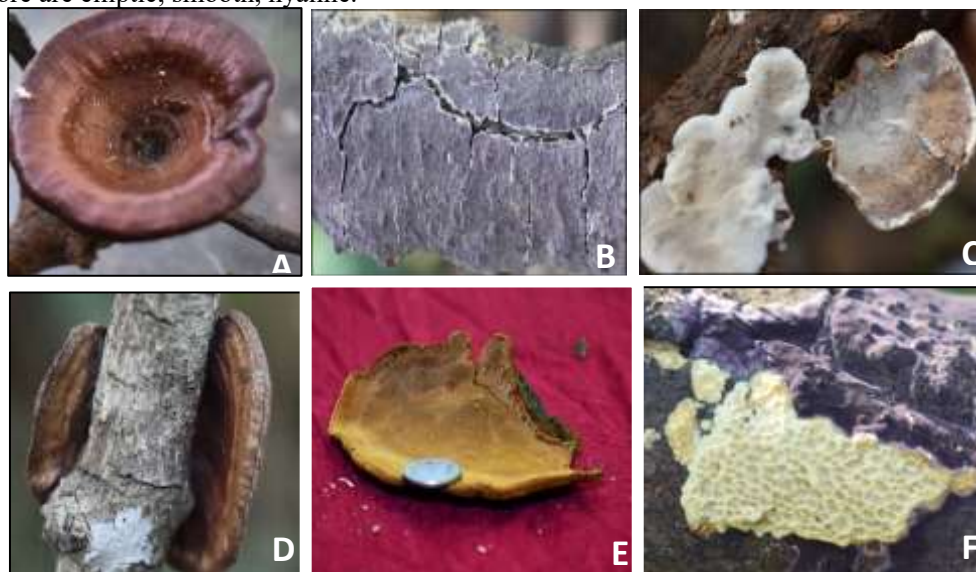
### ***Phellinus* sps (Fr) 1838**

Perennial, pileate, sessile, and typically horseshoe-shaped, it produces basidiocarps. The pore surface is rusty brown when fresh and turns brown when dried, the context is brown, and the upper context is a black carapace, and its tubes are cinnamon yellowish-brown when dried. The pileal surface is dark brown when fresh and turns black when dried. The perennial fruiting body is sessile, 12 cm wide, and 2.5 cm thick. Its colour ranges from yellow to light brown. Smoothness topped the situation. Dimitic was the hyphal structure. On the lower surface, tiny pores are visible. Basidiospores are ovoid to subglobose.

### ***Flavodon flavus* (Kl.) Ryv. 1973**

Fruit body are annual, sessile, resurpinate, thin, leathery, overlapping, broad base attached to substratum, cream color, size of basidiosome is up to 4cm. The upper surface of the margin light brown to yellow. The

fruiting body has concentrically grooved, glabrous, smooth. Margin are entire, thick covered. The pore size is 5.4 mm thick, dark brown, not seen by naked eye. Context yellowish white, Hyphal system dimitic, basidiospore are elliptic, smooth, hyaline.



**Figure 1. Study of Basidiocarp:** A-*Microporous xanthopus* B-*Pinophora* sps C-*Tramates* sps D-*Hexagonia tenuis* E-*Phellinus* sps F- *Flavolus*

### Conclusion

In the present investigation, six new specimens of Aphyllorphorales belongs to 5 different families. Six species, including *Microporous xanthopus*, *Pinophora* sps, *Tramates* sps, *Hexagonia tenuis*, *Phellinus* sps, *Flavolus flavodon*. were identified from the dang region. During the study, it was found that many different places were significantly affected due to excessive human activity. There is an urgent need for the conservation of Aphyllorphorales fungus through proper protection from the Maharashtra government in order to stop some of these species from existing in the near future.

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