

Some Wild Species of Basidiomycetous Fungi (Polypores & Mushrooms) Found in the Way to Daunne Devi Temple, Daunne, Parasi District, Nepal

Rajendra Acharya*

National Herbarium and Plant Laboratories, Godawari, Lalitpur, Nepal

*E-mail: acharya.raj2010@gmail.com

Abstract

The aim of the present study was documentation of some wild species of Basidiomycetous Fungi (Polypores and Mushrooms). The specimens were collected from Daunne Devi temple and its adjoining area, Daunne, Parasi district in October, 2021. Total of 15 species of Basidiomycetous fungi were collected. The identified species represent five orders belonging to seven families and 13 genera. Polyporales was found to be the dominant order in the study area with 8 species which are *Daedaleopsis confragosa*, *Lenzites betulinus*, *Microporus* sp., *Microporus xanthopus*, *Polyporus* spp. (2 species), *Pycnoporus cinnabarinus*, *Steccherinum albo-fibrilosa* and *Trametes versicolor* followed by Agaricales belong to the species of *Echinoderma asperum* and *Schizophyllum commune* and Hymenochaetales includes *Hymenochaete* sp. and *Phellinus gilvus*. Auriculariales and Corticales are represented by single species each.

Keywords: Basidiomycetes, Exploration, Fungi, Wild species, Polypores

Introduction

Fungi produce fleshy fruiting bodies known as mushroom belonging to group Basidiomycetes and Ascomycetes. Basidiomycetes, the Club fungi, is the second largest group followed by Ascomycetes as largest group. The basidiomycetes differ from all other fungi in that they produce the haploid spores called basidiospores in the club shaped basidium during sexual reproduction. They are mostly saprophyte and some are mycorrhizal or obligatory parasite (Alexopoulos & Mims, 1979). They have highly developed, profusely branched and septate mycelium of two types i.e. primary mycelium and secondary mycelium. The most familiar macrofungal members of this class are mushrooms, toadstools, bracket fungi or polypores, etc. Members of basidiomycetes can secrete cellulose and lignin digesting enzymes. Consequently, they are the best known decomposers of wood.

Polypores, also known as 'bracket' or 'shelf' fungi due to 'shelf-like' fruiting bodies of some species, are tubiferous basidiomycetes. They have minute to large tubes (Miller, 1984). The tubes open to the exterior by means of pores. The spore bearing

surface, poral surface is located on the underside of the pileus. In each species these tube mouths, or pores are of definite size and shape (Overholts, 1953). The reproductive cells (basidia) form a layer on the inner surface of the tubes. The fruiting body (basidiocarp) may be fleshy, leathery, tough, corky or woody. If they are fleshy, they seldom have a central stipe and therefore, do not resemble a gilled mushroom. Typically they lack a stipe and with a few exceptions are hoof shaped (like a horse hoof) to 'resupinate' (lying flat on the substratum) on which they are produced. Polypores on the other hand, often have lateral or eccentric stipes or no stipe at all (Miller, 1984). Their hyphae are mono-, di- or trimatic. Their habitat in wood and cause serious decay and so are generally known as 'wood rotting macrofungi' (Adhikari, 1988).

Mushroom can also be defined as a macro-fungus with a distinctive fruiting body which can be either epigeous or hypogeous and easily collected from naked eye (Suman & Sharma, 2005). A mushroom is generally fleshy, spore bearing fruiting body of a fungus, typically produced above ground on soil or on its food source and characterized by heterotrophic mode of nutrition (Shrestha, 2014). It mostly grows

during the rainy season on damp rotten logs of woods, trunks of trees, decaying organic matter and in a damp soil rich in organic matter.

Nepal represents a wide range of ecosystems and habitats because of diverse biogeographic variations represent the country also offers a wide array of mycodiversity. So far, about 1,291 mushroom species have been recorded from Nepal. Among them about 159 species are said to be edible (Devkota & Aryal, 2020) while 100 species are poisonous and 73 species have medicinal values (Adhikari, 2014). Till now, 34 endemic species of mushroom have been described from Nepal (Devkota & Aryal, 2020). The investigation on mushrooms of Nepal started since the work of Lloyd (1808) and Berkeley (1838), ever since several papers have been published and several botanical expeditions have been done (Aryal & Budhathoki, 2013a). Among the biotypes of Nepal, phanerogamic floral diversity has been studied immensely but the study on cryptogamic flora, especially mycodiversity has got less attention (Adhikari, 2012). Mushrooms generally prefer wet region over dry region for its habitat resulting in its high diversity in the central and eastern Nepal as compared to the western Nepal (Acharya & Parmar, 2016).

It has been observed that intense mycological exploration and investigations has been done in central Nepal as compared to eastern and western Nepal (Adhikari, 2000). Moreover, work on mycological exploration and investigation from low land Terai region is less as compared to mountain and hilly region. Therefore, the present study was undertaken to document the uninvestigated mycodiversity on the way to Daunne Devi temple and its proximate area which is situated in the less explored region of central Nepal.

Materials and Methods

Study area

Study area is Daunne Churia forest which lies in the Parasi (Bardaghat, Susta East) district (Figure 1). The forest vegetation is dominated by the species of Dipterocarpaceae, Combretaceae and Fabaceae

families. *Shorea robusta* is the dominant species and are found in association with *Buchanania latifolia*, *Lagerstroemia parviflora*, *Syzygium cumini*, *Terminalia alata* etc. The study of fungi was done in the way to Daunne Devi temple (640 m) north from east-west Mahendra highway and the neighboring area of the temple. The climate of the study area is typically tropical dominated by the southeast monsoon. A hot climate generally prevails throughout the year except in the short winter.

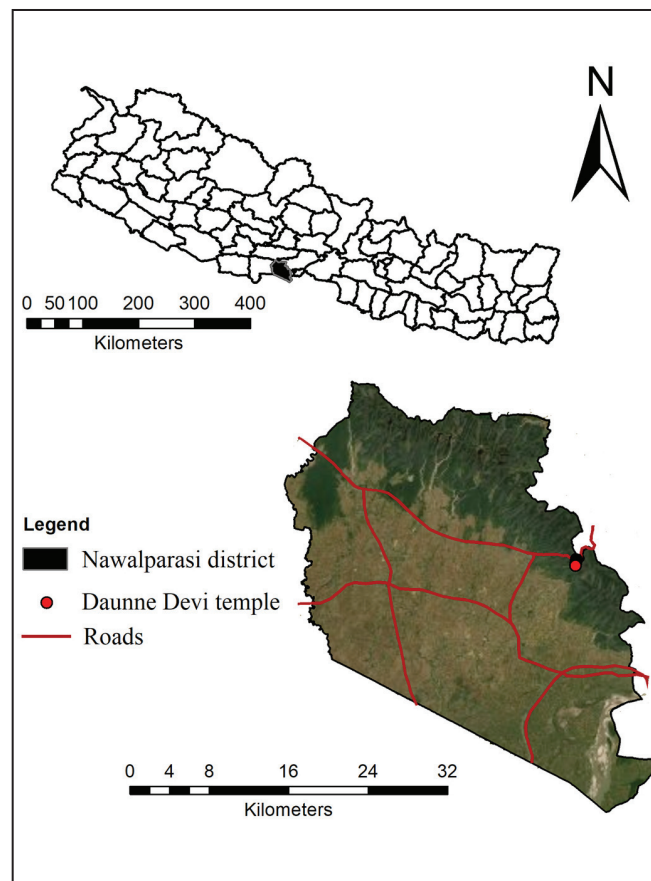


Figure 1: Map of the study area

Collection and Identification

En route to Daunne Devi temple from east-west Mahendra highway and the surrounding area of the temple was extensively explored for Basidiomycetous fungi in October, 2021. During the study, sporocarps encountered were collected. Altogether 15 species of Basidiomycetous fungi were collected. The species collected were well air dried in the shade and packed in paper envelopes with proper tag numbers. The species found in the soil were collected carefully by digging with the help of

a digger. Other specimens which were found to grow on fallen or rotten branches/wooden logs, branches or trunks of dying or dead plants, or trunks of living plants were collected along with their host plant by cutting with the help of saw. During the survey sporocarps encountered were collected described for its identity.

Photographs of all the species were taken in their natural habitat prior to collection. Morphological details such as shape, size, color of the fresh specimens were recorded before preservation. The habitat/substrates including ecological parameters viz. altitude and vegetation composition were also recorded. The paper envelopes were brought to National Herbarium and Plant Laboratories (KATH), Godawari for identification and making herbarium specimens. The identifications were done following key identifying characters (Adhikari, 2014; Alexopoulos & Mims, 1979; Dickson & Lucas, 1979; Miller, 1984; Pacioni, 1981; Svrček, 1983). It was also identified by tallying photographs of the relevant literatures and cross checking the collected specimens to that of identified herbarium specimens deposited at Mycology section of National Herbarium and Plant Laboratories. Some species were also identified seeking the help of expert of Mycology. The nomenclature of all the identified species follows Adhikari (2012, 2014).

Enumeration of species

1. *Auricularia auricula-judae* (Bull.) Quel. [Auriculariales: Auriculariaceae]
Fallen branch of tree, way to Daunne Devi temple, Daunne; 630 m, 18 October 2021, collection no. 2021118, collector- Rajendra Acharya & Nirmal Pokhrel
2. *Daedaleopsis confragosa* (Bolt.: Fr.) Schr. var. *confragosa* [Polyporales: Polyporaceae]
Log of rotten wood, way to Daunne Devi temple, Daunne; 570 m, 18 October 2021, collection no. 2021111, collector- Rajendra Acharya & Nirmal Pokhrel
3. *Echinoderma asperum* (Pers.: Fr.) Bon. [Agaricales: Agaricaceae]
On soil, way to Daunne Devi temple, Daunne, 630 m, 18 October 2021, collection no. 2021121, collector- Rajendra Acharya & Nirmal Pokhrel
4. *Hymenochaete* sp. [Hymenochaetales: Hymenochaetaceae]
Fallen branch of tree, way to Daunne Devi temple, 510 m, 18 October 2021, collection no. 2021101, collector- Rajendra Acharya & Nirmal Pokhrel
5. *Lenzites betulinus* (L.: Fr.) Fr. [Polyporales: Polyporaceae]
Log of *Xeromphis spinosa*, collection no. 2021113, 580 m; Log of rotten wood, collection no. 2021112, way to Daunne Devi temple, 590 m, 18 October 2021, collector- Rajendra Acharya & Nirmal Pokhrel
6. *Laeticorticium* sp. [Corticiales: Corticiaceae]
Fallen branch of tree, way to Daunne Devi temple, 510 m, collection no. 2021102, collector- Rajendra Acharya & Nirmal Pokhrel
7. *Microporus* sp. [Polyporales: Polyporaceae]
Fallen branch of tree, way to Daunne Devi temple, 560 m, collection no. 2021110, collector- Rajendra Acharya & Nirmal Pokhrel
8. *Microporus xanthopus* (Fr.) Kuntz. [Polyporales: Polyporaceae]
Fallen branch of *Terminalia alata* Roth, way to Daunne Devi temple, 630 m, collection no. 2021120, collector- Rajendra Acharya & Nirmal Pokhrel
9. *Phellinus gilvus* (Schw.) Pat. [Hymenochaetales: Hymenochaetaceae]
Decayed log of *Shorea robusta* Gaertn., collection no. 2021103, 512 m, Log of wood, collection no. 2021107, way to Daunne Devi temple, 550 m, 18 October 2021, collector- Rajendra Acharya & Nirmal Pokhrel
10. *Polyporus* sp. [Polyporales: Polyporaceae]
Stump of unknown tree, collection no. 2021117, way to Daunne Devi temple, 630 m, 18 October 2021, collector- Rajendra Acharya & Nirmal Pokhrel

11. *Polyporus* sp. [Polyporales: Polyporaceae]
Log of rotten wood, collection no. 2021116, way to Daunne Devi temple, 620 m, 18 October 2021, collector-Rajendra Acharya & Nirmal Pokhrel
12. *Pycnoporus cinnabarinus* (Jacq.: Fr.) Karst. [Polyporales: Polyporaceae]
Log of *Shorea robusta* Gaertn., collection no. 2021104, 515 m; Log of decayed wood, collection no. 2021105, way to Daunne Devi temple, 540 m, 18 October 2021, collector-Rajendra Acharya & Nirmal Pokhrel
13. *Schizophyllum commune* (Fr.) Fr. [Agaricales: Schizophyllaceae]
Fallen branch of *Xeromphis spinosa* (Thunb.) Keay, way to Daunne Devi temple, 580 m, 18 October 2021, collection no. 2021109, collector-Rajendra Acharya & Nirmal Pokhrel
14. *Steccherinum albo-fibrilloso* (Hjort. Ryv.) Hallenb. & Hjort. [Polyporales: Meruliaceae]
Dead branch of unidentified living tree, way to Daunne Devi temple, 610 m, 18 October 2021, collection no. 2021114, collector- Rajendra Acharya & Nirmal Pokhrel
15. *Trametes versicolor* (L.) Lloyd [Polyporales: Polyporaceae]
Log of decayed wood, way to Daunne Devi temple, 610 m, 18 October 2021, collection no. 2021115, collector- Rajendra Acharya & Nirmal Pokhrel

Results and Discussion

Total of 15 species of Basidiomycetous fungi from five orders belonging to 7 families and 13 genera were collected from the study area (see in the enumeration of species). During collection, at least one basidiocarp was left for their spore dispersal which support sustainable and scientific collection practice (Adhikari, 2000). Although distribution of macro-fungal species is low in hot and dry season, but this collection of Basidiomycetous fungi was carried out during autumn season for the species commonly found in this season rather than rainy season resulting in fewer collections. Most of the

collected Basidiomycetous fungi are the members of polyporales. Polyporales, the dominant order, in the study area with 9 species was followed by Agaricales and Hymenochaetales (2 species) (Figure 2). Similarly, Polyporaceae was found to be the dominant family represented by 8 species. It was followed by Hymenochaetaceae represented by two species (Figure 3).

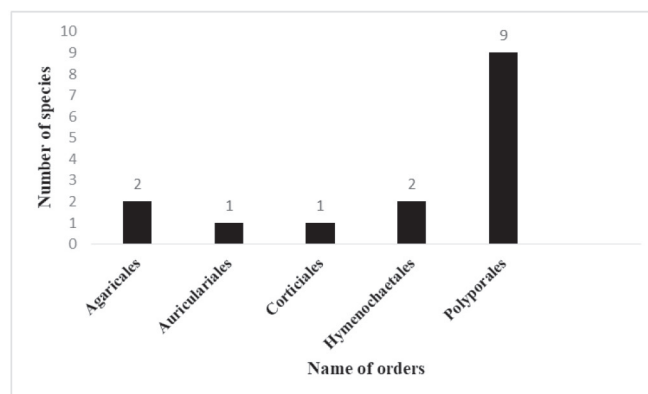


Figure 2: Orders representing number of species in the study area

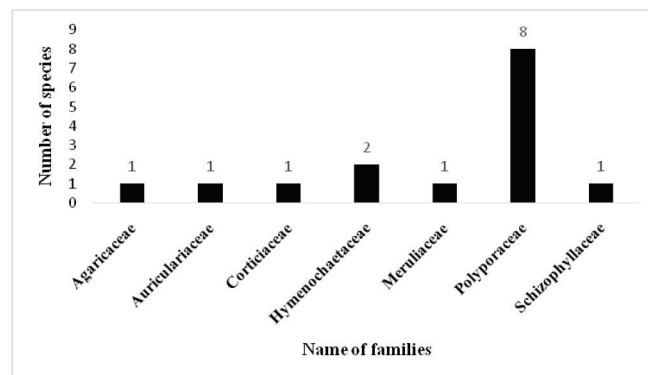


Figure 3: Families representing number of species in the study area

Polypores were the most common and were found to grow on dead woods, fallen logs, stumps, rotten branches and dead branches of trees. Out of 15 fungal species, *Daedaleopsis confragosa* var. *confragosa*, *Pycnoporus cinnabarinus*, *Trametes versicolor* and *Polyporus* sp. were found to be common in the study area. *Auricularia auricula-judae* and *Pycnoporus cinnabarinus* reported in the present study area were reported by Aryal & Budhathoki (2013b) at Sankarnagar community forest, Rupandehi district, Central Nepal. Similarly, species of *Auricularia auricula-judae*, *Daedaleopsis confragosa* var. *confragosa*, *Lenzites betulinus*, *Microporus*

xanthopus, *Polyporus* sp., *Pycnoporus cinnabarinus* and *Schizophyllum commune* reported in the present study area were also reported by Acharya (2020b) at Mayadevi collaborative forest, Rupandehi district, Central Nepal. Species of *Polyporus*, *Microporus xanthopus* and *Schizophyllum commune* reported in the present study area were also reported by Acharya (2020a) in Dhikura village and its adjoining Rotepakho community forest in Arghakhanchi district, central Nepal.

All the species of host plants or substrates of the fungal species were not identified due to being almost rotten old wooden logs and fallen branches.

Conclusion

Total of 15 species of Basidiomycetous fungi were collected from study area. Identified species represent five orders belonging to 7 families and 13 genera. Polyporales and Polyporaceae were the dominant order and family respectively.

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Figure : Some basidiomycetous fungi, **A.** *Microporus xanthopus* (Fr.) Kuntz., **B.** *Polyporus* sp., **C.** *Schizophyllum commune* (Fr.) Fr., **D.** *Daedaleopsis confragosa* var. *confragosa* (Bolton) J. Schrot.