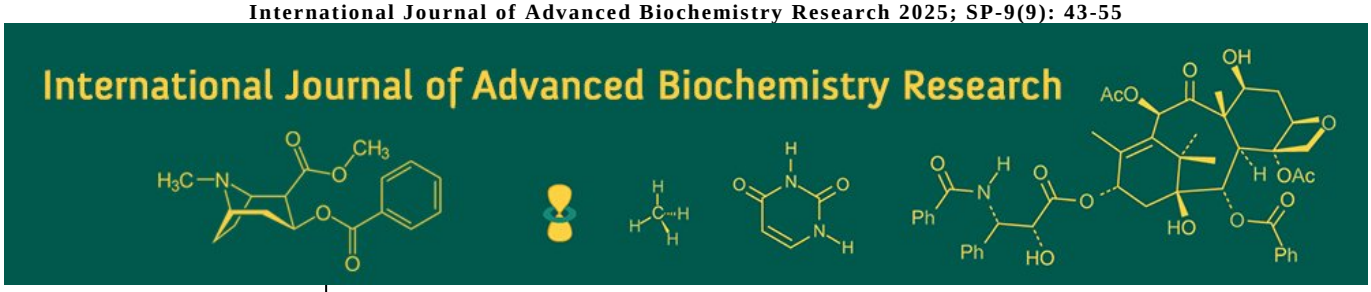

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A Reports on Wild Mushrooms Diversity from Mid-Himalayas of Bharsar, Uttarakhand

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Abstract
A systematic survey of wild macrofungi was conducted in the temperate evergreen forests of the Bharsar region, Pauri Garhwal, Uttarakhand, situated at elevations between eighteen hundred and twenty-three hundred meters above sea level. Field visits and specimen collection were carried out from August to June during the academic year two thousand twenty-four to two thousand twenty-five. Sixty distinct mushroom species were recorded from various locations and identified based on morphological traits. These belonged to thirty-seven genera, thirty-two families and ten orders within the phyla *Basidiomycota* and *Ascomycota*. Among these, twenty-two species were edible, eighteen inedible or poisonous, thirteen medicinal and seven of unknown edibility. The most represented families included Agaricaceae, Russulaceae and Polyporaceae, with dominant orders such as Agaricales, Polyporales and Russulales. The study highlights the rich macrofungal diversity and ecological significance of the Bharsar region.

Keywords: Collection, diversity, mushrooms, survey, morphological identification, mid- Himalya, Uttarakhand

Introduction
Fungi are non-photosynthetic eukaryotes that obtain nutrients through saprophytic or parasitic modes (Ainsworth *et al*., 1973; Webster and Weber, 2007)[1, 46]. Macrofungi, which produce visible fruiting bodies such as ascocarps and basidiocarps, represent approximately 10% of global fungal diversity (Rossman, 1994) [26]. Belonging mainly to *Ascomycota* and *Basidiomycota*, these fungi serve vital ecological functions as decomposers and mycorrhizal partners. While some mushrooms are edible or medicinal, others are toxic or inedible (Upadhyaya and Upadhyaya, 2019) [38]. Their identification is typically based on macroscopic traits such as cap shape, gill attachment and spore color (Singer, 1986; Phillips, 2010)[34, 25] along with habitat preferences (Arora, 2008; Karwa and Rai, 2010) [3, 15]. Nutritionally, mushrooms are rich in digestible protein (10-40% dry weight) and bioactive compounds with antimicrobial, antidiabetic and cardioprotective effects (Chang, 1991; Bahl, 1983; Vaz *et al*., 2012) [8, 4, 39]. In India, mushroom cultivation began in the 1960s with ICAR's support and now includes species like *Agaricus bisporus*, *Pleurotus* spp. and *Calocybe indica* (Singh *et al*., 2011; ICAR, 2020) [35, 13]. The northwestern Himalayan region, including Uttarakhand, is known for its macrofungal richness due to altitude and vegetation diversity (Vishwakarma *et al*., 2011) [41], though several areas remain poorly explored (Bhatt *et al*., 1999; Das and Sharma, 2005) [5, 11].
Bharsar, situated in the mid-hills of Pauri Garhwal, is characterized by temperate forests and diverse tree species such as *Quercus*, *Rhododendron*, *Juglans* and *Cedrus*, which support a variety of wild mushrooms including *Ramaria* and *Clavaria* (Bisht and Sharma, 2014) [7]. The area features numerous native species like *Corylus jacquemontii*, *Quercus leucotrichophora*, *Q. floribunda*, *Q. semecarpifolia*, *Aesculus indica*, *Rhododendron arboreum*, *Juglans regia*, *Alnus nepalensis*, *Cedrus deodara*, *Lyonia ovalifolia*, *Pinus roxburghii* and *Taxus baccata* sub sp. *wallichiana* (Bisht and Sharma, 2014) [7]. The term "Bharsar," meaning "land rich in natural resources," reflects its ecological abundance. Although previous studies have documented plant diversity in this region (Bisht and Sharma, 2014; Chauhan *et al*., 2014) [7, 10], macrofungal surveys are lacking. Due to heavy rainfall during the study period, fungal collection was partially limited. This study aims to document the macrofungal diversity of Bharsar under studied forest ecosystems. Specimens were identified using field and morphological characteristics (Semwal *et al*., 2018) [29].

2. Materials and Methods

2.1 Study area

The present study was conducted in the Bharsar region, situated in the Pauri Garhwal district of Uttarakhand, India. This area lies within the temperate climatic zone of the Western Himalayan region, which is known for its rich biodiversity and varied ecological conditions. The study area is located between 30°03′24″ to 30°03′38″ N latitude and 78°59′10″ to 79°00′16″ E longitude, with an elevation ranging from 1800 to 2300 meters above mean sea level, recorded using a GPS enabled mobile application based on GIS technology (Fig. 1).

2.2 Collection of samples

Field surveys were conducted from August 2024 to June 2025 in various forested sites and altitudinal zones of the Bharsar region to assess wild macrofungal diversity. Fruiting bodies were collected using scissors, digging tools and hunting knives, with fragile and woody specimens carefully packed in sterile biodegradable bags or aluminum foil to avoid mechanical damage. Soil and debris were gently removed in the field using a soft brush, and high-resolution photographs were taken with a Narzo 50A mobile camera for preliminary identification. In the laboratory, samples were disinfected, labeled and examined. Macroscopic features such as size, shape, surface texture, color (referenced using the Methuen Handbook of Colour; Kornerup and Wanscher, 1978) [18], odor, taste, bruising reactions and spore print color were recorded. Additionally, ecological data including forest type, dominant vegetation, substrate, slope and altitude were documented to aid in understanding species distribution and habitat preferences.

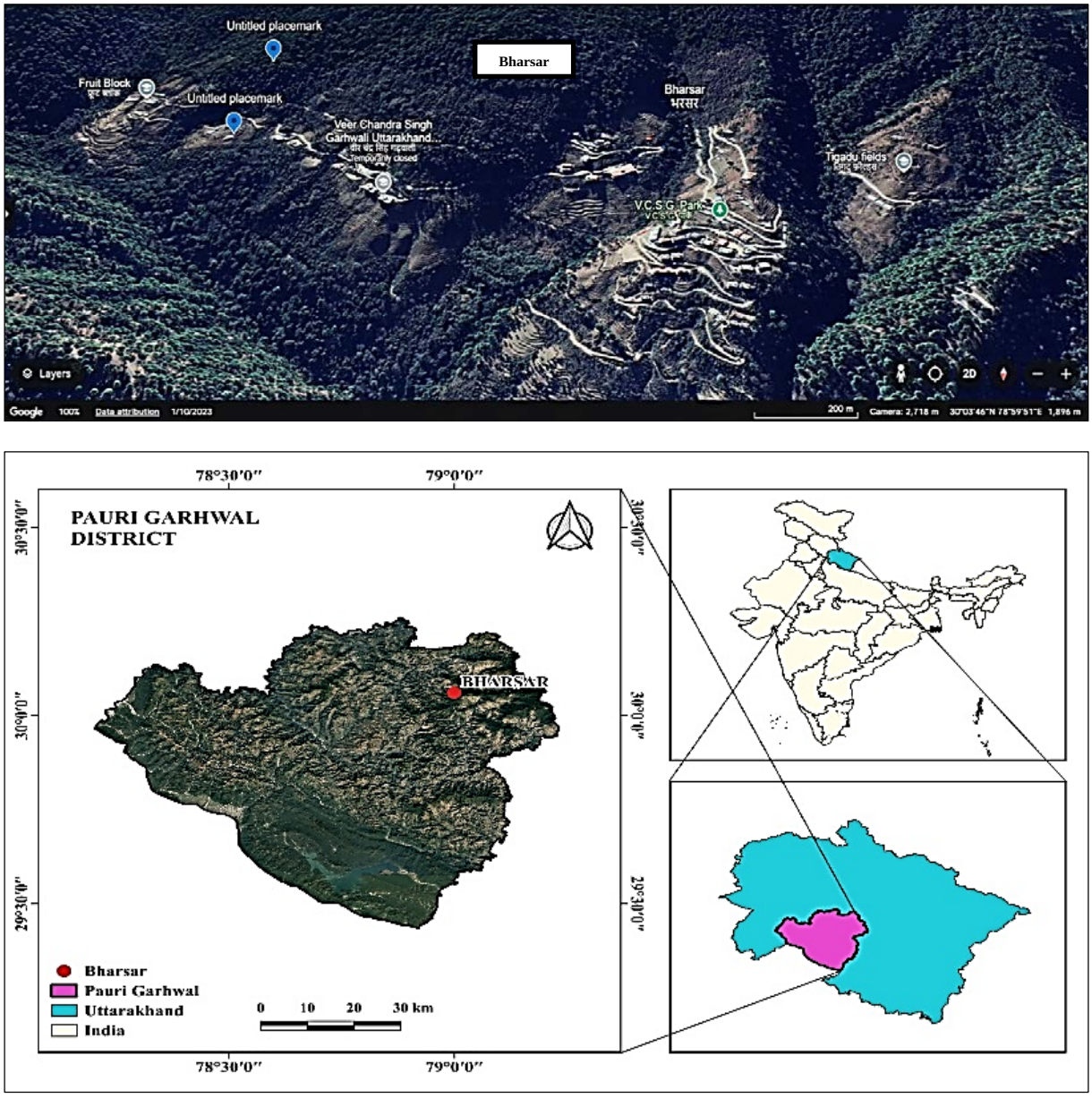


Fig 1|: Map of study area

3. Result and Discussion

A total of sixty wild macro fungal species were collected and identified from the Bharsar region of Uttarakhand during the academic year two thousand twenty-four to two thousand twenty-five(Fig. 7). These species, belonging to thirty-two families and ten fungal orders, were found growing on diverse substrates such as open fields, hardwoods, conifers, leaf litter and dead logs (Fig. 5) across altitudes ranging from eighteen hundred to twenty-three hundred meters (Fig. 6). Most fruiting bodies appeared

between August and January due to favorable temperature, humidity and high rainfall, especially in August, which supported prolific emergence (Sharma and Jaitly, 2021) [33]. Morphological characteristics such as cap size, shape, texture, color, gill type and attachment, spore print, smell, stem features and ecological parameters like substrate, slope and forest type were recorded for each specimen (Table 2). Economic categorization revealed that thirty-six percent of the species were edible, thirty percent poisonous, twenty-two percent medicinal and twelve percent of unknown edibility (Fig. 4). In the present study, sixty species belonging to thirty two families including five species of Marasmiaceae, four species of Russulaceae and Amanitaceae, three species of each of the family Pleurotaceae, Clavaariaceae, Mycenaceae, Hymenogastraceae and Polyporaceae, two species of each of the family Omphalotaceae, Hygrophaceae, Bolbitiaceae, Polyporeaceae, Meruliaceae and Agaricaceae and one species of each of the family Ganodermataceae, Clitocybaceae, Lycoperdaceae, Gomhaceae, Clavulinaaceae, Auriculariaceae, Tremellaceae, Pyronemataceae, Psathyrellacae, Geastracae, Trichomataceae, Tubariacea, Hymenochaetaceae, Laetiporacea, Sparassidacea and Strophariaceae and ten orders were identified, Agaricales and Polyporales emerged out to be the dominant mushroom orders all species were collected from different location of Bharsar region which shown on (Fig. 2 and Fig. 3).This study reveals the rich macrofungal diversity of the Bharsar region and underlines the ecological roles and potential economic value of these mushrooms, suggesting the need for further exploration, conservation and sustainable utilization.

Table 1: Details of different wild mushroom species, collected from forest area near Bharsar region.

S. No.	Sample number	Mushroom species	Family	Order	Time of collection	Elevation			Substratum	Important features	Reference's
						Altitude (m)	Latitude (N)	Longitude (E)			
	BH1	*Ganoderma lucidum*	Ganodermataceae	Polyporales	August 2024	1979	30.059058º	79.002609º	Roots	Medicinal	(Vishwakarma *et al*., 2011; Mishra *et al*., 2021) [41, 23]
	BH3	*Clitocybe* sp.	Clitocybaceae	Agaricales	September 2024	2000	30.057973º	79.004883º	Leaf litter	Poisonous	(Sharma and Jaitly, 2021) [33]
	BH4	*Lentinula edodes*	Omphalotaceae	Agaricales	March 2025	2127	30.059058º	79.002609º	Dead wood	Edible/ Medicinal	(Ao *et al*., 2016) [2]
	BH5	*Amanita vaginata*	Amanitaceae	Agaricales	August 2024	2006	30.059064º	79.012609º	soil	Edible	(Rout *et al*., 2020; MW *et al*., 2014) [27, 22]
	BH7	*Pleurotus sapidus*	Pleurotaceae	Agaricales	March 2025	1832	30.059046º	79.002609º	Dead wood	Edible	(MW *et al*., 2014) [22]
	BH8	*Lycoperdon pratense*	Lycoperdaceae	Agaricales	October 2024	1979	30.059065º	79.002409º	soil	Edible	(Ao *et al*., 2016; Mishra *et al*., 2021) [2, 23]
	BH9	*Hygrocybe cantharellus*	Hygrophaceae	Agaricales	August 2024	1961	30.059001º	79.002309º	Leaf litter	Edible	(Sharma and Jaitly, 2021; Rout *et al*., 2020) [33, 27]
	BH10	*Pleurotus ostreatus*	Pleurotaceae	Agaricales	November 2024	1968	30.056080º	78.002309º	Dead wood	Edible	(Sharma and Jaitly, 2021; Rout *et al*., 2020) [33, 27]
	BH11	*Lepiota cristata*	Agaricaceae	Agaricales	November 2024	1979	30.055931º	78.002309º	Leaf litter	Poisonous	(Rout *et al*., 2020) [27]
	BH12	*Lepiota clypeolaria*	Agaricaceae	Agaricales	August 2024	1945	30.059028º	78.992758º	soil	Poisonous	(Rout *et al*., 2020) [27]
	BH13	*Ramaria auera*	Gomhaceae	Gomphalus	September 2024	2234	30.057973º	78.992918º	Leaf litter	Edible	(Singh *et al*., 2017; Sharma and Jaitly, 2021) [36, 33]
	BH14	*Clavarias* sp.	Clavariaceae	Agaricales	September 2024	2259	30.059058º	78.992709º	Leaf litter	Edible	(Rout *et al*., 2020) [27]
	BH15	*Clavuilla sprucei*	Clavulinaceae	Cantharellales	November 2024	2236	30.059064º	78.992376º	Litter	Edible	(Mishra *et al*., 2021) [23]
	BH17	*Clavaria fumosa*	Clavariaceae	Agaricales	September 2024	2155	30.059046º	78.992499º	Leaf litter	Edible	(Rout *et al*., 2020) [27]
	BH18	*Clavaria fragilis*	Clavariaceae	Agaricales	September 2024	2275	30.059065º	78.999014º	Leaf litter	Edible	(Rout *et al*., 2020) [27]
	BH16	*Pleurotus eryngii*	Pleurotaceae	Agaricales	March 2025	2279	30.059025º	78.992408º	Bark of tree	Edible	(MW *et al*., 2014) [22]
	BH19	*Auricularia auricula judae*	Auriculariaceae	Auriculariales	May 2025	1968	30.059028º	78.032309º	Dead wood	Edible/ Medicinal	(Rout *et al*., 2020; Ao *et al*., 2016) [27, 2]
	BH28	*Tremella foliacea*	Tremellaceae	Tremellalus	May 2025	2234	30.056254º	78.996209º	Tree bark	Edible	(Singh *et al*., 2018; Sharma and Jaitly, 2021) [36, 33]
	BH35	*Aleuria aurantia*	Pyronemataceae	Pezizales	August 2024	2042	30.059001º	78.992709º	Soil	Edible	(Singh *et al*., 2017) [36]
	BH66	*Armillaria tabescens*	Physalacriaceae	Agaricales	September 2024	1835	30.059064º	79.002609º	Dead wood	Edible	(Terashima *et al*., 2011) [37]
	BH21	*Mycena* sp.	Mycenaceae	Agaricales	January 2025	2000	30.059058º	78.032309º	Dung	Unknown	(Sharma and Jaitly, 2021; Rout *et al*., 2020) [33, 27]
	BH24	*Deconica coprophila*	Strophariaceae	Agaricales	August 2024	2022	30.057992º	78.099309º	Dung	Poisonous	(Kaul *et al*., 2019; Mycomap database) [16]

	BH20	*Panaeolus rickenii*	Bolbitiaceae	Agaricales	August 2024	1979	30.057973º	78.065309º	Dung	Unknown	(Vyas *et al*., 2014; Semwal and Bhatt, 2019; Choudhary and Tripathy, 2016) [44,16, 9]
	BH26	*Conocybe lactea*	Bolbitiaceae	Agaricales	November 2024	2018	30.062515º	78.095109º	Dung	Poisonous	(Rout *et al*., 2020) [27]
	BH27	*Psathyrella* sp.	Psathyrellaceae	Agaricales	November 2024	2025	30.056321º	78.063309º	soil	Edible	(Vyas *et al*., 2014; Kaul *et al*., 2019; Choudhary and Tripathy, 2016) [44,27, 9]
	BH32	*Psilocybe* sp.	Hymenogastraceae	Agaricales	December 2024	1979	30.065241º	78.992758º	Dead wood	Medicinal	(Semwal and Bhatt, 2019) [28]
	BH55	*Marasmius bulliardii*	Marasmiaceae	Agaricales	March2025	2000	30.059046º	79.002609º	Leaf litter	Poisonous	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH56	*Marasmius androsaceus*	Marasmiaceae	Agaricales	March 2025	2002	30.059028º	79.012609º	Leaf litter	Poisonous	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH103	*Psilocybe semilanceata*	Hymenogastraceae	Agaricales	March 2025	2048	30.056321º	78.095109º	Soil	Medicinal	(Kumar and Netam, 2022) [20]
	BH102	*Mycena* sp.	Mycenaceae	Agaricales	April 2025	2025	30.062515º	78.005509º	Dead logs	Poisonous	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH105	*Mycena plumipes*	Mycenaceae	Agaricales	May 2025	1693	30.065221º	78.996209º	Soil	Poisonous	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH82	*Marasmius oreades*	Marasmiaceae	Agaricales	September 2024	2125	30.065214º	79.002363º	Dead logs	Medicinal	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH81	*Tetrapyrgos brevicystidiata*	Marasmiaceae	Agaricales	August 2024	1945	30.032114º	79.002465º	Leaf litter	Unknown	(Honan *et al*., 2015; Kamuran *et al*., 2020) [33, 27]
	BH84	*Hebeloma* sp.	Hymenogastraceae	Agaricales	August 2024	2128	30.057992º	78.002309º	Dead logs	Poisonous	(Shah *et al*., 2023; Lakhanpal, 2014) [31, 21]
	BH74	*Hygrocybe* sp.	Hygrophoraceae	Agaricales	November 2024	1979	30.052394º	78.002399º	Leaf litter	Some edible	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH33	*Geastrum saccatum*	Geastraceae	Geastrales	September 2024	2048	30.009632º	78.997918º	Soil	Poisonous	(Mishra *et al*., 2021; Roat *et al*., 2020) [23, 27]
	BH36	*Omphalina postii*	Tricholomataceae	Agaricales	August 2024	2002	30.032114º	78.992376º	soil	Poisonous	(Vyas *et al*., 2014; Semwal and Bhatt, 2019) [44, 24]
	BH2	*Amanita* sp.	Amanitaceae	Agaricales	September 2024	1968	30.059028º	79.007133º	Soil	Poisonous	(Roat *et al*., 2020; MW *et al*., 2014) [27, 22]
	BH6	*Hygrocybe persistant*	Hygrophaceae	Agaricales	September 2024	1977	30.059025º	79.002619º	soil	Edible	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH25	*Tubaria furfuraca*	Tubariaceae	Agaricales	September 2024	2016	30.057045º	78.005509º	Soil	Poisonous	(Semwal and Bhatt, 2019; M *et al*., 2014) [28, 22]
	BH30	*Armillaria* sp.	Physalacriaceae	Agaricales	August 2024	1983	30.032114º	78.002309º	Dead wood	Edible	(Mona *et al*., 2014; Terashima *et al*., 2011; M *et al*., 2014) [22, 37]
	BH31	*Gymonopus* sp.	Omphalotaceae	Agaricales	November 2024	1967	30.065214º	78.002309º	Soil	Poisonous	(JP *et al*., 2023) [14]
	BH37	*Trametes versicolor*	Polyporeaceae	Polyporales	May 2025	2006	30.065214º	78.992408º	Dead wood	Medicinal	(MO *et al*., 2014; Sharma and Jaitly, 2021) [22, 33]
	BH38	*Podoscypha petalodes*	Meruliaceae	Polyporales	August 2024	2021	30.052394º	78.992499º	Dead wood	Unknown	(Sharma and Jaitly, 2021) [33]
	BH39	*Podosypha* sp.	Meruliaceae	Polyporales	November 2024	2036	30.057992º	78.999014º	Dead wood	Unknown	(Sharma and Jaitly, 2021) [33]
	BH40	*Tramets* sp.	Polyporaceae	Polyporales	April 2025	2085	30.057045º	78.992918º	Dead wood	Medicinal	(MO *et al*., 2014; Sharma and Jaitly, 2021) [22, 33]
	BH22	*Microporus xanthopus*	Polyporeaceae	Polyporales	April 2025	2010	30.059064º	78.061309º	Twinges	Medicinal	(Mishra *et al*., 2021) [23]
	BH41	*Hymenochaete rubiginosa*	Hymenochaetaceae	Hymenochaetales	August 2024	2065	30.059028º	78.002509º	Dead wood	Poisonous	(Sharma and Jaitly, 2021; Mishra and Sharma, 2019) [33, 24]
	BH42	*Laetiporus*	Laetiporaceae	Polyporales	April 2025	2049	30.057973º	78.002309º	Dead wood	Edible	(AO *et al*., 2016; Sharma and Jaitly, 2021) [2, 33]

	BH80	*Colyptella capulla*	Marasmiaceae	Agaricales	September 2024	2025	30.065221º	79.002696º	Dead Wooden logs	Unknown	(Sharma and Jaitly, 2021) [33]
	BH94	*Trametes* sp.	Polyporaceae	Polyporales	August 2024	2021	30.059028º	79.882609º	Dead logs	Medicinal	(Sharma and Jaitly, 2021; Km *et al*., 2014) [33, 19]
	BH98	*Polypores* sp.	Polyporaceae	Polyporales	September 2024	2236	30.059064º	79.002309º	Dead logs	Medicinal	(Semwal *et al*.,2014; Bhattacharya *et al*., 2015) [30, 6]
	BH99	*Sparasssis crispa*	Sparassidaceae	Polyporales	September 2024	2234	30.059025º	78.002309º	Dead logs	Edible/ Medicinal	(Sharma *et al*., 2022) [32]
	BH104	*Hygrocybes* sp.	Hygrophoraceae	Agaricales	August 2024	2049	30.056254º	78.0632309º	Roots	Edible	(Sharma and Jaitly, 2021; Roat *et al*., 2020) [33, 27]
	BH46	*Russula aeruginea*	Russulaceae	Russulales	September 2024	1831	30.059046º	79.002409º	Soil	Poisonous	(Roat *et al*., 2020) [27]
	BH47	*Russula amoenolens*	Russulaceae	Russulales	August 2024	1835	30.059065º	79.002309º	Soil	Poisonous	(Roat *et al*., 2020) [27]
	BH51	*Rusulla californiensis*	Russulaceae	Russulales	November 2024	1845	30.057973º	79.002209º	Soil	Edible	(Mishra *et al*., 2021) [23]
	BH52	*Amanita jacksonii*	Amanitaceae	Agaricales	September 2024	1800	30.059058º	79.002209º	Soil	Edible	(Mishra *et al*., 2021) [23]
	BH53	*Russula atropurpurea*	Russulaceae	Russulales	August 2024	1831	30.059064º	79.012209º	Soil	Poisonous	(M O *et al*., 2014; Roat *et al*., 2020)[22, 27]
	BH48	*Amanita* sp.	Amanitaceae	Agaricales	November 2024	1864	30.059028º	79.012609º	Soil	Poisonous	(Roat *et al*., 2020) [27]

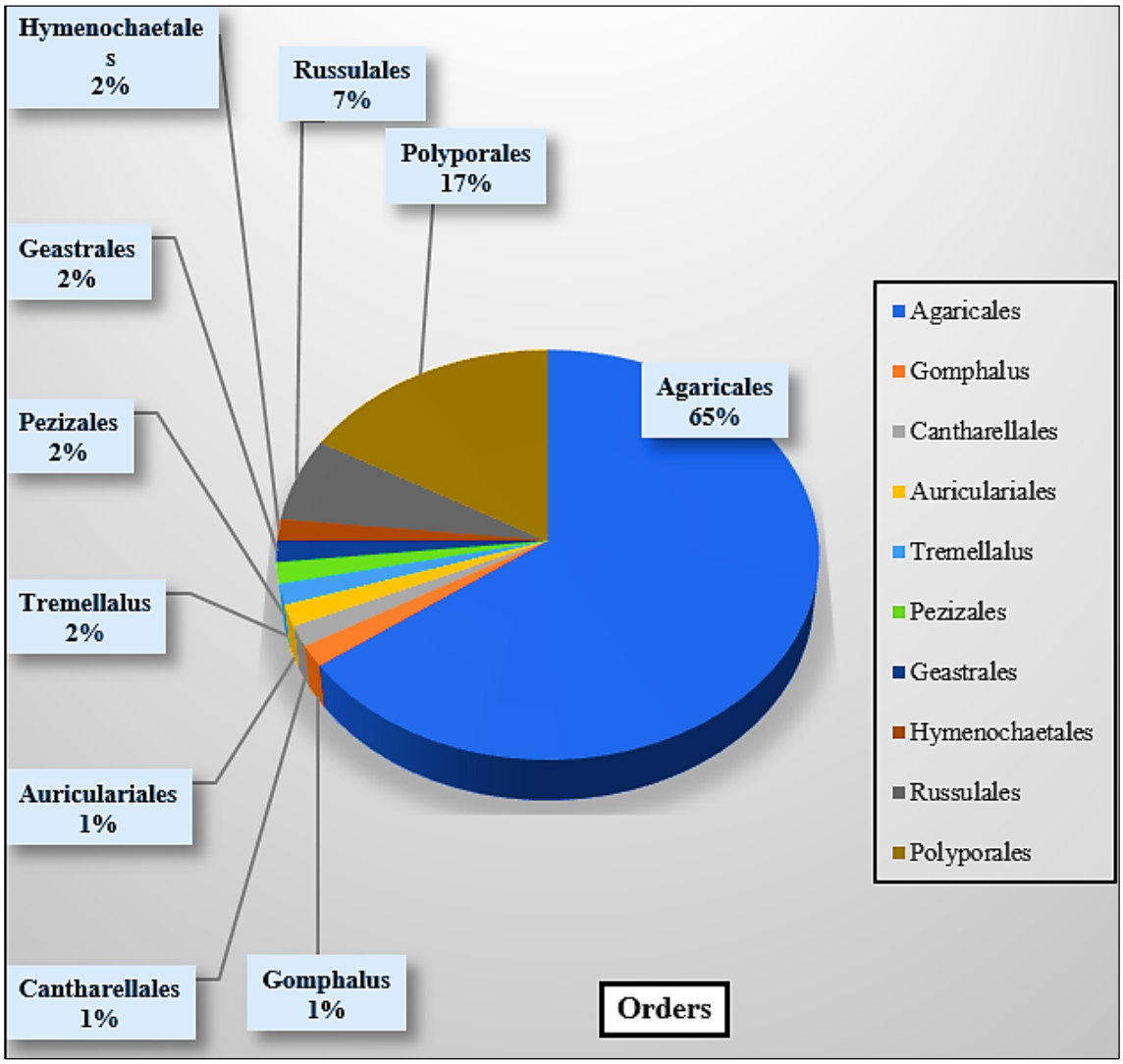


Fig 2: Per cent abundance of different wild mushrooms orders from study area

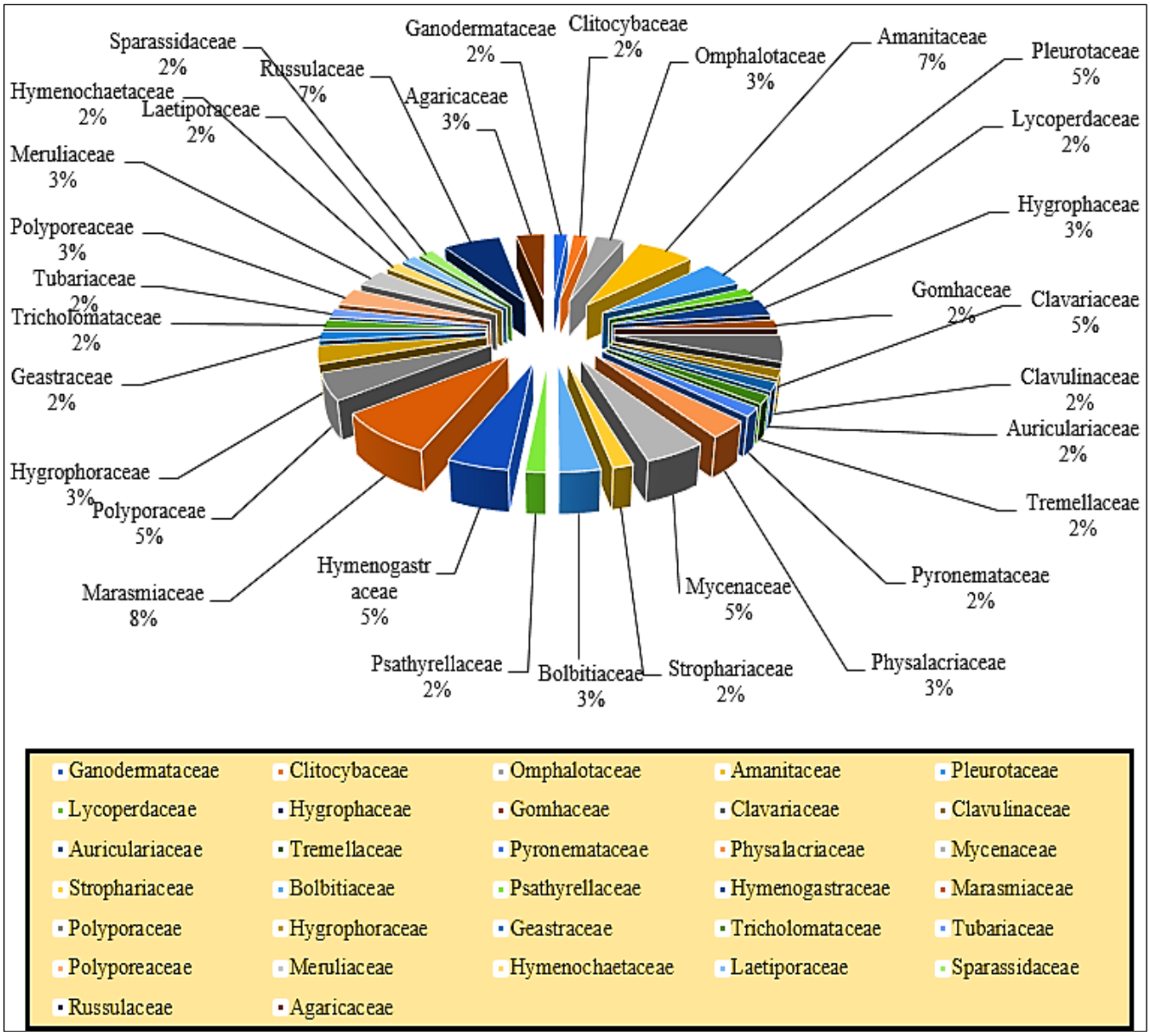


Fig 3: Per cent abundance of different wild mushrooms families from study area

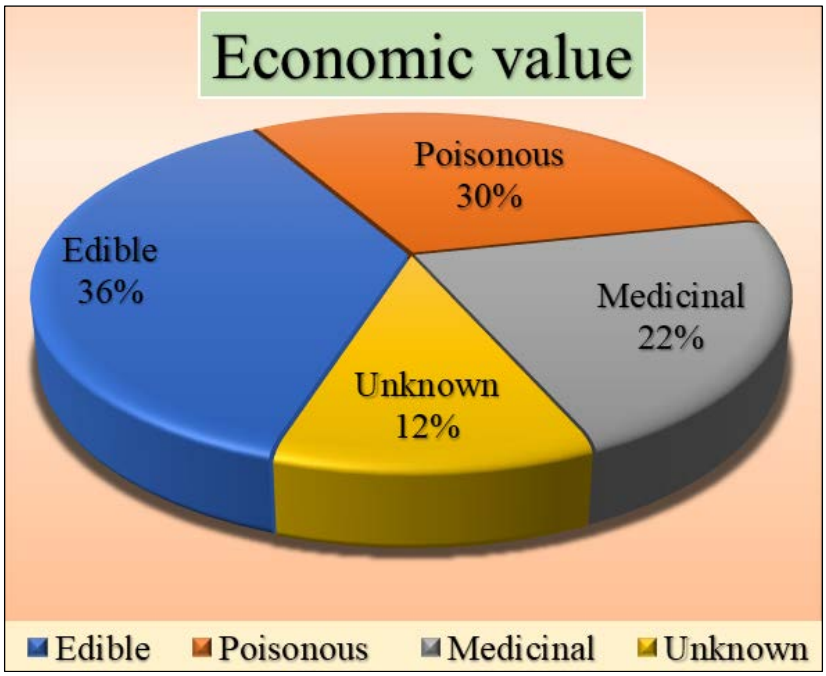


Fig 4: Wild mushrooms in term of their per cent contribution to the total number of species (economic value) in the study area

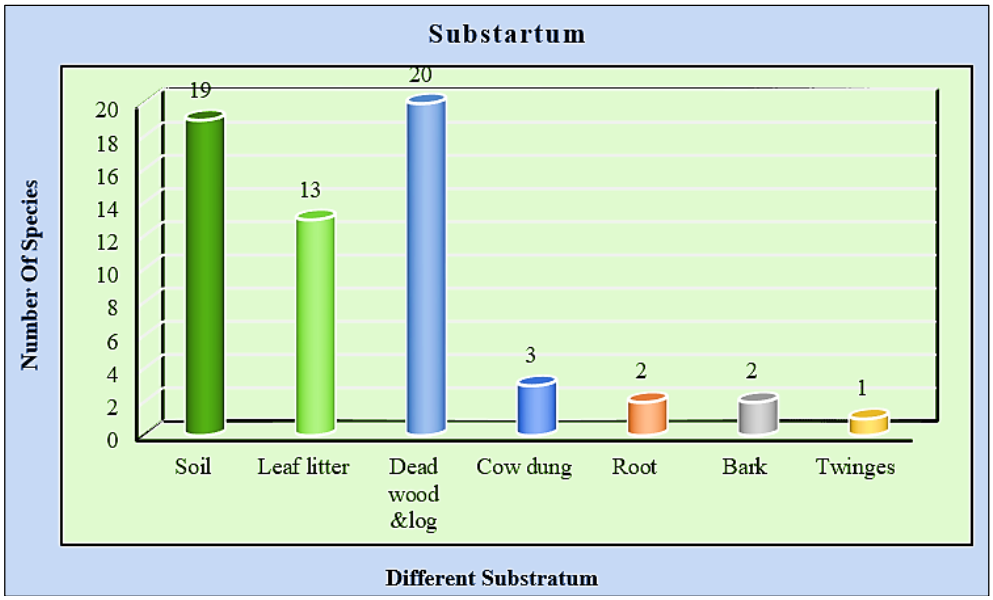


Fig 5: Number of wild mushrooms per centage on different substratum

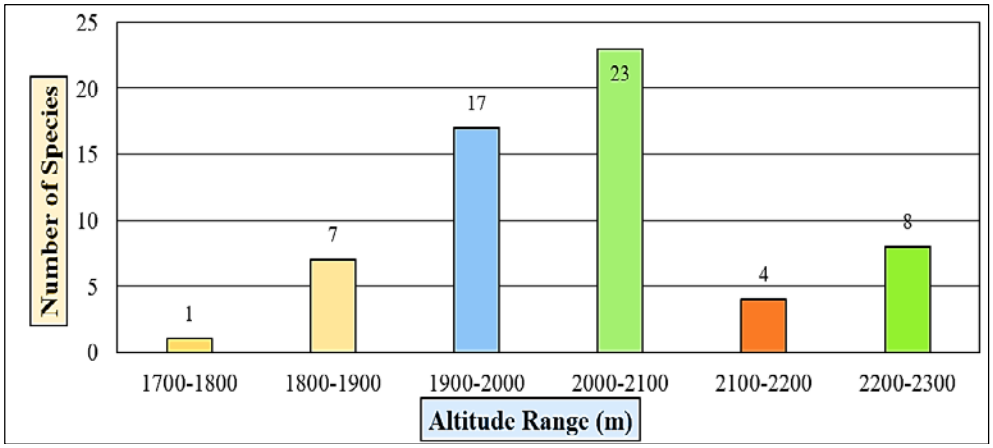


Fig 6: Number of wild mushrooms at different altitude range (m) from study area

Table 2: Morphological characteristics for identification of different wild mushroom species

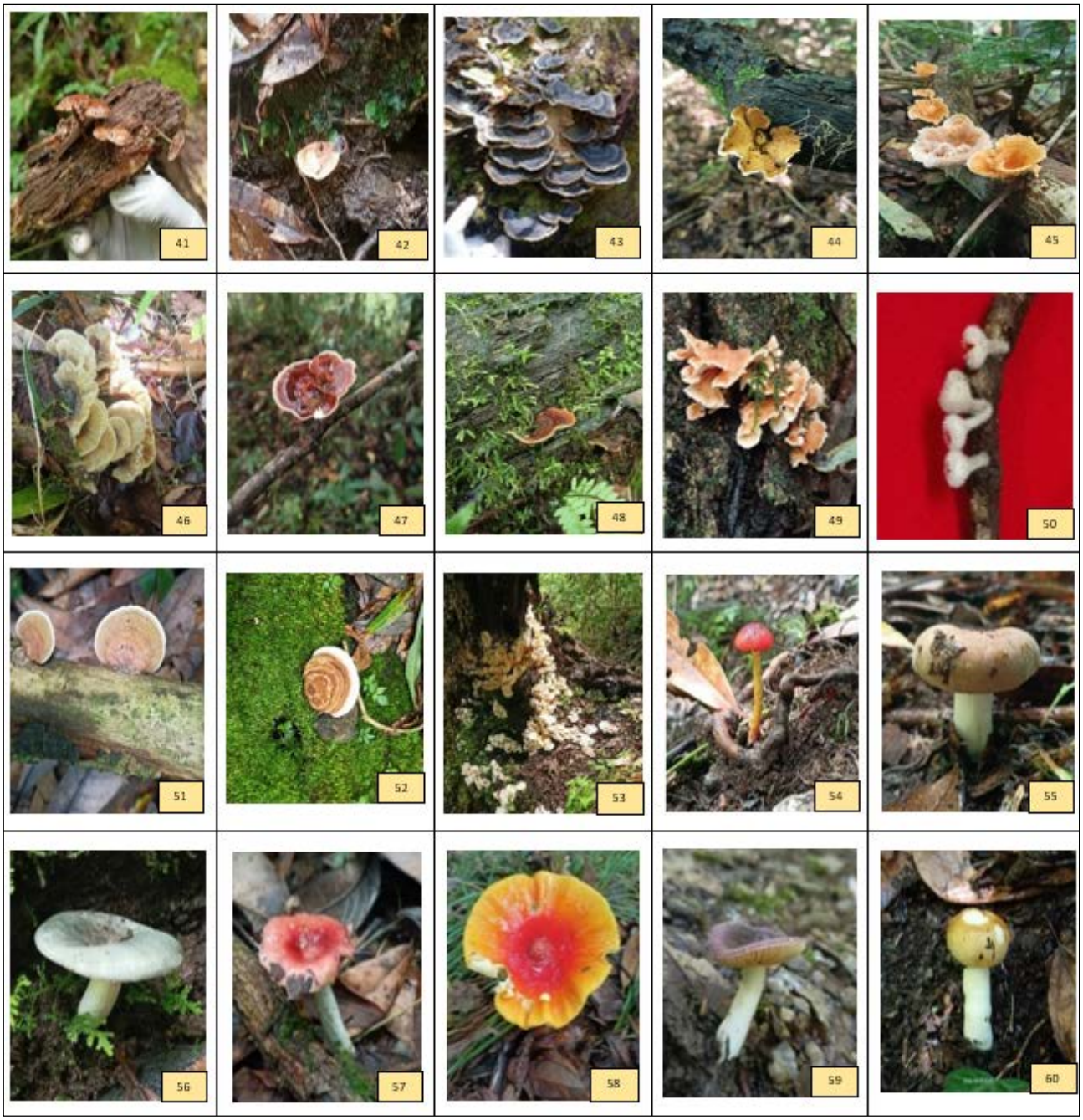
S. No.	Mushroom species	Pileus (cap)				Lamellae (gills)		Stipe (stem)				Spore bearing under cap	Annuls (ring)
		Morphology (shape)	Colour	Surface (Texture)	Diameter range (cm)	Attachment	Colour	Length range (cm)	Diameter range (cm)	Attachment	Colour		
	Ganoderma lucidum	Flat	Shiny dark brown	Velutinous	4.5 - 10	-	-	4.7-8.5	1.5 - 2.5	Lateral	Dark brown	Pores	Absent
	Clitocybe sp.	Infundibuliform	Creamy white	Glabrous	6 - 9.2	Decurrent	Creamy white	5-7	1.1 - 2	Central	white	Gills	Absent
	Lentinula edodes	Convex	Light purple and radish	Areolate	7 - 10.4	Adnexed	White	2.6-7	1 - 2	Central	Light brown	Gills	Absent
	Amanita vaginata	Convex	Brown with white border	Pubescent	6 - 7.25	Seceding	Muddy colour	10.1-13	2.5 - 3	Central	White	Gills	Present
	Pleurotus sapidus	Infundibuliform	Light brown	Squamulose	7 - 9.5	Decurrent	White	8 - 12	2 - 4.5	Central	Creamy white	Gills	Absent
	Lycoperdon pratense	Convex	Creamy white	Squamulose	1. - 3.85	-	-	3.8 - 4.2	-	-	-	Pores	Absent
	Hygrocybe cantharellus	convex	orange	velutinous	2.2. - 3.5	Decurrent	orange	9 - 13.5	0.5 - 1.5	Central	Orange	Gills	Absent
	Pleurotus ostreatus	Oyster	White to gray	Glabrous	5.5 - 12	Decurrent	white	6.5 - 9	4.5 - 5	Lateral	White	Gills	Absent
	Lepiota cristata	Umbonate	Light brown	Pubescent	2.5 - 3.6	Andexed	white	4.2 - 6.2	0.5 - 1	Central	White	Gills	Absent
	Lepiota clypeolaria	Campanulate	Creamy brown	Squamulose	4 - 7	Free	white	8 - 14	1 - 1.8	Central	Light brown	Gills	Absent
	Ramaria auera	Cylindrical flashy	Light creamy	Glabrous	-	-	-	5 - 9.8	0.2 - 0.5	Central	Creamy light brown	-	Absent
	Clavarias sp.	Cylindrical	light pinkish	Glabrous	-	-	-	8 - 9.8	0.5 - 1.4	Central	Pinkish	-	Absent
	Clavuilla sprucei	Hairy structure	White	Glabrous	-	-	-	-	-	Central	Brown	-	Absent
	Clavaria	Flashy	Light	Glabrous	-	-	-	5.5 - 6.2	0.6 - 1.6	Central	Muddy	-	Absent

	fumosa		grayish										
	Clavaria fragilis	Cylindrical	Milky white	Glabrous	-	-	-	2.5 - 4.5	0.7 - 1	Central	white	-	Absent
	Pleurotus eryngii	Cochleariform	Creamy white with colored spots	Glabrous	8.2 - 10.4	Decurrent	Creamy brown	5.3 - 6.4	4.6 - 7.2	Central	white	Gills	Absent
	Auricularia auricula judae	Flat	Light orange brown	velutinous	7 - 8.2	-	-	-	-	-	Ornge	Jelly	Absent
	Tremella foliacea	Flat	Beetroot colour	Smooth	-	-	Light red	-	-	-	-	Jelly	Absent
	Aleuria aurantia	Depressed	Orange	Jellytinoush	3.2 - 5	-	Orange	-	-	-	-	Jelly	Absent
	Armillaria tabescens	Flat	Orange	Glabrous	3 - 7	Adenexed	Orange	-	-	-	-	Gills	Absent
	Mycena sp.	Conical	Light brown	Glabrous	1 - 2.45	Emarginate	Broen	3 - 4.2	0.4 - 0.8	Central	Shiny brown	Gills	Absent
	Deconica coprophila	Ovate	Shiny brown	Fibrillose	2 - 3.2	Free	Brown	3.2	0.1 - 0.5	Central	Golden brown	Gills	Absent
	Panaeolus rickenii	Ovate	Fade blackish	Glabrous	4	Seceding	Light brown	2 - 3.9	0.5 - 1	Central	White	Gills	Absent
	Conocybe lactea	Ovate	Light brown white	Glabrous	5.1 - 6.3	Free	White	3 - 4.5	0. - 0.3	Central	Creamy whitish	Gills	Absent
	Psathyrella sp.	Convex	Whitish	Pubescent	2.2 - 4.2	Free	White	3 - 7	0.2 - 0.5	Eccentric	Golden white	Gills	Absent
	Psilocybe sp.	Convex	Light gray	Fibrillose	1.5 - 2.5	Adnexed	brown	2.2 - 3.2	0.6 - 1.1	Eccentric	Gray brown	Gills	Absent
	Marasmius bulliardii	Ovate	White	Smooth	0.5 - 1	Free	White	3 - 5	0.1 - 0.3	Central	Brown	Gills	Absent
	Marasmius androsaceus	Flat	Light red	Glabrous	1 - 2.5	Emarginate	Red	2 - 5	0.1 - 0.3	Central	Red	Gills	Absent
	Psilocybe semilanceata	Conical	Brown	Pubescent	1.5 - 3.6	Emarginate	White	1.2 - 2.4	1 - 2	Eccentric	White	Gills	Absent
	Mycena sp.	Convex	White	Villose	1.9 - 2.1	Emarginate	White	1 - 3	0.4 - 0.6	Central	White	Gills	Absent
	Mycena plumipes	convex	Dark brown	velutinous	1 - 2	Sinuate	Gray	1 - 1.3	0.9 - 1.2	Central	Gray	Gills	Absent
	Marasmius oreades	Convex	Pink	Glabrous	1.5 - 2.7	Free	Creamy white	2 - 3	0.6 - 0.9	Eccentric	White	Gills	Absent
	Tetrapyrgos brevicystidiata	Umbilicate	Red	Fibrillose	2.3 - 3.7	Subdecurrent	Pink	3.2 - 5	0.4 - 0.9	Center	Red	Gills	Absent
	Hebeloma sp.	Depressed	White	Smooth	3.2 - 3.5	Seceding	Creamy white	2.2 - 3.2	1 - 2	Lateral	White	Gills	Absent
	Hygrocybe sp.	Convex	Yellow	Squamulose	1.5 - 2.2	Decurrent	Orange	10 - 15	0.2 - 0.4	Center	Yellow	Gills	Absent
	Geastrum saccatum	Star like	Muddy colour	Rough	2.5 - .3.3	-	Black	-	-	-	Pores	-	Absent
	Omphalina postii	Depressed	orange	Glabrous	2.2 - 5	Seceding	Orange	2 - 5	1 - 1.5	Central	Orange	Gills	Absent
	Amanita sp.	ovate	Redish orange	velutinous	3.3 - 5.6	Subdecurrent	Yellow	7 - 12.5	0.7 - 2.5	Central	yellow	Gills	Absent
	Hygrocybe persistant	Umbonate	orange yellowish	velutinous	2 - 4.25	Free	White	5 - 7.2	1 - 2.5	Central	Orange	Gills	Absent
	Tubaria furfuraca	Flat	Dark brown to light brown	velutinous	1.2 - 1.6	Emarginate	White	6 - 9	0.1 - 0.6	Central	Brown	Gills	Absent
	Armillaria sp.	Convex	Shiny brown	Velutinous	2 - 4	Emaerginate	Dark brown	3 - 7	0.5 - 1	Eccentric	Dark brown	Gills	Absent
	Gymonopus sp.	Flat	Creamy brown	Villose	2.2 - 2.6	-	Light orange	-	-	Central	Red brown	Gills	Absent
	Trametes versicolor	Ear like	Blck	Rough	5 - 12	-	Pores grey	-	-	Sessile	-	Pores	Absent
	Podoscypha petalodes	bracket - shaped, or kidney - shaped	Yellow	Velvety	6.3 - 12	-	Pores white	-	-	Central	-	Pores	Absent
	Podosypha sp.	bracket - shaped	Orange	Rough	4 - 9	-	Pores white	-	-	Central	-	Pores	Absent
	Trametes sp.	bracket - shaped, or kidney - shaped	Light orange	Smooth	6 - 10	-	Pores white	-	-	Sessile	-	Pores	Absent
	Psilocybe sp.	Convex	Light gray	Fibrillose	1.5 - 2.5	Adnexed	brown	2.2 - 3.2	0.6 - 1.1	Eccentric	Gray brown	Gills	Absent
	Hymenochaete rubiginosa	bracket - shaped	Brown	Hardy surface	5 - 12	-	Pores white	-	-	Sessile	-	Pores	Absent
	Laetiporus sp.	Fan shaped	Creamy brown	Smooth	6 - 19.5	-	Pores white	-	-	Sessile	-	Pores	Absent
	Colyptella capulla	Cup like	Velvet red	Velvet	1.1 - 1.4	-	White	0.1 - 1.2	1.1 - 1.3	Center	White	Teeth	Absent
	Trametes sp.	Kidney shaped	Fade orange	Hard	2.2 - 3.6	-	White	-	-	-	-	Pores	Absent
	Polypores sp.	Flat	Light brown	Hard rough	10 - 19	-	White	-	-	-	-	Pores	Absent

							pores						
	Sparasssis crispa	Bubble	White	Smooth	1.5 - 6	-	White pores	-	-	-	-	Pores	Absent
	Hygrocybes sp.	Convex	Red	Squamulose	1.3 - 2.3	Free	Yellow	1 - 2.4	1.4 - 1.6	Central	Yellow	Gills	Absent
	Russula aeruginea	Depressed	Soil colour	Rough	7 - 15	Adnate	Whie	2 - 5	2 - 4	Central	White	Gills	Absent
	Russula amoenolens	Depressed	Greenish white	Rough	6.3 - 9.4	adnate	Greenish	1..9 - 6	2 - 4.5	Central	White	Gills	Absent
	Rusulla californiensis	Depressed	Reddish pink	Sticky Glabrous	6 - 10	Free	White	6 - 9	2 - 2.5	Central	White	Gills	Absent
	Amanita jacksonii	Depressed	Orange red	Sticky Glabrous	8 - 15	Decurrent	Orange	10 - 15	2.2 - 3	Central	White	Gills	Absent
	Russula atropurpurea	Depressed	Purple	Sticky Glabrous	4.3 - 7	Sinuate	Purple	2 - 6	2 - 3	Central	White	Gills	Absent
	Amanita sp.	Convex	Light yellow	Glabrous	2 - 4	Emarginate	White	2 - 7	1.5 - 3	Central	White	Gills	Absent

1. Ganoderma lucidum 2. Clitocybe sp. 3. Lentinula edodes 4. Amanita vaginata 5. Pleurotus sapidus 6. Lycoperdon pratense 7. Hygrocybe cantharellus 8. Pleurotus ostreatus 9. Lepiota cristata 10. Lepiota clypeolaria 11. Ramaria auera 12. Clavarias sp. 13. Clavuilla sprucei 14. Clavaria fumosa 15. Clavaria fragilis 16. Pleurotus eryngii 17. Auricularia auricula judae 18. Tremella foliacea 19. Aleuria aurantia 20. Armillaria tabescens

21. *Mycena* sp. 22. *Deconica coprophila* 23. *Panaeolus rickenii* 24. *Conocybe lactea* 25. *Psathyrella* sp. 26. *Psilocybe* sp. 27. *Marasmius bulliardii* 28. *Marasmius androsaceus* 29. *Psilocybe semilanceata* 30. *Mycena* sp. 31. *Mycena plumipes* 32. *Marasmius oreades* 33. *Tetrapyrgos brevicystidiata* 34. *Hebeloma* sp. 35. *Hygrocybe* sp. 36. *Geastrum saccatum* 37. *Omphalina postii* 38. *Amaanita* sp. 39. *Hygrocybe persistant* 40. *Tubaria furfuraca*



41. Armillaria sp. 42. Gymonopus sp. 43. Trametes versicolor 44. Podoscypha petalodes 45. Podosypha sp. 46. Tramets sp. 47. Microporus xanthopus 48. Hymenochaete rubiginosa 49. Laetiporus sp. 50. Colyptella capulla 51. Trametes sp. 52. Polypres sp. 53. Sparasssis crispa 54. Hygrocybes sp. 55. Russula aeruginea 56. Russula amoenolens 57. Rusulla californiensis 58. Amanita jacksonii 59. Russula atropurpurea 60. Amanita sp.

Fig 7: Photographs of collected wild mushrooms from study area.

4. Conclusion

In the present investigation, extensive surveys were conducted during 2024-2025 at various locations around the Bharsar region of Pauri Garhwal to document the diversity of wild mushrooms. A total of sixty species were collected and identified based on macroscopic characteristics such as cap and stem shape, coloration, gill arrangement, texture, spore print and substrate preference, with identification supported by standard taxonomic literature. While many of the recorded species resemble known edible types, their edibility cannot be confirmed solely through morphological traits, as some morphologically similar mushrooms may be toxic. Therefore, consumption should be avoided until molecular or biochemical identification is performed. The study highlights the Bharsar region rich macrofungal diversity and its ecological and potential economic significance. Further research, including molecular analysis, is essential to validate species identity and to explore their applications in food, medicine and conservation efforts.

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