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Diversity of Mushroom in Sundarvan - A Nature Discovery Centre Ahmedabad, Gujarat, India

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ABSTRACT

The present study incorporates the vast diversity of mushroom species found on different substratum in the premises of Sundarvan-A Nature Discovery Centre, Ahmedabad by emphasizing the good biodiversity of the area despite being in the busy and confined location of the city. Sundarvan is a mini zoo with dense vegetation supporting diverse species of flora and fauna and managing a natural habitat for species in its premises. In the area monsoon season varies from late July to October; the season is peculiar to observe various species of mushrooms in the region. The substratum on which fungi was observe includes Soil, Green Wood, Dead Wood, Dead leaves, Soil debris or Tree Stem. The study was carried out in the Sundarvan, the mini zoo, Ahmedabad, Gujarat from August 2020 to October 2021. The present study gives the diversity of Mushroom belonging to 18 families, 24 Genus and 32 species.

Keywords: Ahmedabad, Fungi, Mushroom, Sundarvan Park, diversity.

1. INTRODUCTION

Fungi are one of the most prominent and biodiverse organisms to inhabit and influence this planet (Sarbhoy et al., 1996). Fungi are considered to be neither animal nor plant but they differ from plants in that they lack the green chlorophyll that plants use to manufacture their own food and energy and thus they are placed in a different Kingdom of their own. Mushroom is the fleshy or spore bearing fruiting body of a fungus; it typically is produced above ground, on soil, or on its food source. Mushrooms mostly grow during moist environment and thus one can observe mushroom highly more likely in the monsoon season at different places.

There are several different species of mushroom each with its own characteristics like, shape, color and growing substratum, many species of mushrooms are considered edible and are used in various cuisine, however not every species is safe to consume i.e., it can be poisonous on various extent also many species have medicinal use and hence it contributes towards diet, income and health. A mushroom is a "macro fungus with a distinct fruiting body which can be either epigeous (above ground) or hypogenous (underground) and large

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enough to be seen by naked eye and to be picked by hand". Mushroom is a general term used mainly for the fruiting body of the macro fungi (Ascomycota & Basidiomycota).

Mushroom is a type of fungus and hence chlorophyll is absent, it is unable to synthesize its own food and hence is dependent upon the organic matter/substrate for food. At many places mushrooms can be found in mutual associations like, (mycorrhizal) with the roots of several forest trees. Mushrooms are seasonal fungi, which occupy diverse niches in nature in the forest ecosystem. Mushroom species are the indicators of the forest life support system (Stamets, 2000). Among the total known mushrooms, approximately 850 species are recorded from India. Many of them have been used in food and folk medicine for thousands of years (Thatoi and Singdevsachan, 2014). According to our liberal and conservative estimates there may be 3000 to 440 species of macro fungi, respectively in Gujarat (Lahiri et al., 2008).

2. MATERIALS AND METHODS

Study Area

The study was conducted at the Sundarvan-A Nature Discovery Centre lies 23°01'38.3"N 72°31'17.6"E. Set in the heart of Ahmedabad city, Gujarat, India. It is a unique facility of the Centre for Environment Education (CEE). This four-acre land was originally a mango orchard, converted into a Nature Discovery center from 28 October 1978. It is a green oasis of the city and has been categorized as a mini zoo, by the Central Zoo Authority (CZA), the apex governance body for Zoos of India.

It is a mini zoo with various species of vegetation and animals (Non captive). Despite being in the hustle of the busy city it manages to inhabit diversity of flora and fauna which might not be common for city visitors. Different species of large trees, lush green area and mini cages with birds and animals it is a blissful place to enjoy the moments of peace, through it is open for visitors it still has a lot of space that remain undisturbed and where the wild diversity can be observe in its natural habitat including some reptiles, birds and insects. Due to the large diversity of vegetation the availability of mushroom substratum is more, and hence it provides various species of mushrooms. Species are observed on trees, wooden objects, and fallen logs and on ground.

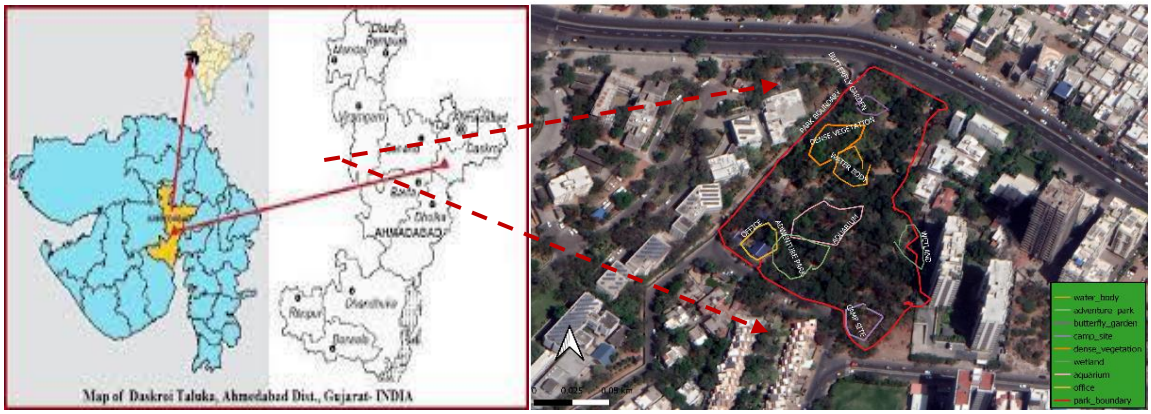

Figure 1 Location of Study Field in a Map; (Sundarvan-A Nature Discovery Centre)

Method

The data collection was done from the year of 2020 to 2021. Peak of the data collection was in the monsoon season. The data was collected by the means of photographic collection of the species observed in the field during the study period. Most of the identification was done by the literature review of highly reviewed articles and research papers. The morphological characters were noted and were then compared to the data from the literature review including the photographic data. Different characters like cap shape, gills, color of the spore print, stipe character, substratum, edibility and poisonous were taken into the consideration for the identification.

Standard morphological characters were used in identification of mushroom like cap shape, gills type, color of the spore print, ecological type, and edibility. The species of Mushroom were identified by comparing the morphological characters found in the literature available (Kokni et al., 2019; Parihar et al., 2015; Chandulal et al., 2013). Identification was also done by the key available in book by Thomas Lassoes (2013).

3. RESULT

Mushrooms are widespread in nature and they remain the earliest form of fungi known to mankind. Mushroom appears to be collected and consumed during almost the entire of the year, but most fungi are collected during the rainy seasons, suggesting the importance of rainfall patterns in fungal phenology. Fungi are cosmopolitan in its distribution they are found in all the places in season of Monsoon. The present study shows 32 species of Mushroom belonging to 24 genera of 18 families that were found distributed in the region of the study area as in (Table 1). About 14 species are edible out of 32 species. All these species are majorly found in the substratum like soil, hard wood, base tree stem, dead wood, and trunk of tree, root of dead tree, dead leaves and small sticks, dead grass.

Table 1 List of Mushroom genus found during the study period at the Sundarvan- A mini zoo, Ahmedabad (Gujarat)

Sr. No.	Family	Genus	Substratum
1	Agaricaceae	*Lepiota*	Soil
2	Agaricaceae	*Leucocoprinus*	Base of tree stem
3	Agaricaceae	*Leucocoprinus*	Soil
4	Amanitaceae	*Amanita*	Hard wood
5	Amanitaceae	*Amanita*	Soil
6	Bolbitiaceae	*Hebeloma*	Soil
7	Bolbitiaceae	*Panaeolus*	Dead Wood
8	Cantharellaceae	*Cantharellus*	Dead wood
9	Entolomataceae	*Clitopilus*	Wood
10	Entolomataceae	*Entoloma*	Wood
11	Fomitopsidaceae	*Postia*	Trunk of tree
12	Ganodermataceae	*Ganoderma*	Wood
13	Ganodermataceae	*Ganoderma*	Soil
14	Incertaesedis	*Pseudohydnum*	Dead wood
15	Lycoperdaceae	*Lycoperdon*	Root of Dead tree
16	Marasmiaceae	*Marasminus*	Dead leaves and small sticks
17	Marasmiaceae	*Marasminus*	Dead leaves
18	Marasmiaceae	*Xeromphalina*	Dead wood
19	Mycenaceae	*Mycena*	Soil
20	Pleurotsceae	*Pleurotus*	Wood
21	Pluteaceae	*Pluteus*	Soil and wood
22	Polyporaceae	*Cryptoporus*	Wood
23	Psathyrellaceae	*Parasola*	Dead wood
24	Psathyrellaceae	*Parasola*	Dead grass
25	Russulaceae	*Bondarzewia*	Hard wood
26	Russulaceae	*Russula*	Wood
27	Russulaceae	*Russula*	soil
28	Schizophyllaceae	*Schizophyllum*	Dead wood
29	Tricholomataceae	*Collybia*	soil
30	Tricholomataceae	*Megacollybia*	Dead wood

Figure 2 Species Mushroom diversity collected from the study field (Number according to the Table 1)

4. DISCUSSION & CONCLUSION

The field, in which the study was carried out, i.e., at Sundarvan Nature Park, has identified about 30 species of mushrooms. Species have been found in different substratum, Sundarvan is a nature reserve open to the public, but it is rich in flora diversity, with different species of trees and shrubs. The natural flora of the park is not disturbed and the plants are allowed to grow in the available space without restricting any space and the way for visitors is carved around it this maintains the natural environment of the park and gives it a look of a mini forest. Mushrooms also acts as bioindicators for the landscape, very rarely but still can be used to know the composition of heavy metals in the ground. These organisms are a common as well as important structural and functional element of many land ecosystems, as the most important link which participates in generation and mineralization of soils (up to 90% share in humus generation) (Marzuki and Ying, 2017).

If one considers the above mention then one may distinguish the species with good bioindication characteristics, which specifically react to changes in environment (Koroleva et al., 2015). Mushrooms can be used in monitoring of land ecosystems, woodlands in particular, as indicators of air and soil pollution and, among others, as bioindicators of environment pollution with heavy metals (Altıntığ et al., 2017; Paluch et al., 2017). Diversity of mushroom in a confined area with regular human interference also marks the good biodiversity of the area, and richness of the soil and land.

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Conflicts of interests

The authors declare that there are no conflicts of interests.

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Ethical approval

The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

Data and materials availability

All data associated with this study are present in the paper.

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