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DISEASE CAUSING FOREST FUNGI OF SONBHADRA,CHANDAULI AND MIRZAPUR REGION

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ABSTRACT

Fungi act as decomposers by breaking down organic matter in nature, and many form beneficial relationships with plants in the soil. However, some fungi develop parasitic relationships with plants, such as rusts and leaf spots. These disease-causing fungi obtain their nutrients from the plants they infect. They cause significant damage, leading to symptoms like wilting, scabs, moldy coatings, rust-like patches, and rotting tissue. In more developed areas, plant diseases are estimated to reduce crop yields by about 10% annually, while in less developed regions, the yield loss due to diseases can be more than 20%. Forests provide essential resources such as timber, fuel, and fodder, and also help conserve soil and water, regulate climate, support wildlife, and offer recreational and aesthetic benefits to humans. There is a strong connection between plants and their environment. In forest nurseries, various diseases like damping-off, root rot, stem rot, leaf curl, wilt, canker, rust, and decay can be observed. In this study, we have examined specific and widespread plant diseases in forest nurseries of Sonebhadra, Chandauli, and Mirzapur districts in Uttar Pradesh, India, caused by fungal pathogens. Many soil-dwelling fungi can live as saprophytes, completing part of their life cycle in the soil, and are known as facultative saprophytes. Pathogenic conditions can result from both biotic and abiotic factors. Fungi reproduce both sexually and asexually through the production of spores and other structures. Spores can travel long distances through air or water, or they may be present in the soil. Fungi have been classified into four groups by Alexopolous and Mims (1979) as Zygomycetes, Ascomycetes, Basidiomycetes, and Deuteromycetes. In my research, most plant-disease-causing fungi belong to the Ascomycetes and Basidiomycetes groups. These have been studied because there has been very little previous research conducted in different forest areas.

KEYWORDS: FUNGI, DECOMPOSER, FOREST, DISEASE, SPORES

MATERIALS AND METHODS

FIELD SURVEY

The effectiveness of any fungal study largely depends on a well-planned and systematic sampling approach. The sampling method used in this study aimed to ensure that the collected samples accurately reflected the diversity and extent of fungal infections in forest nurseries of the selected districts—Sonebhadra, Chandauli, and Mirzapur in eastern Uttar Pradesh, India. These districts were selected for their extensive forest cover, varied climatic conditions, and active government and private nurseries that produce seedlings of both native and introduced species. Field data collection was conducted using sterilized tools to avoid contamination among samples. Essential tools included sterilized forceps, scalpels, scissors, polythene bags, permanent markers, GPS devices, and field notebooks. Before each use, instruments were sterilized with 70% ethanol or flame to maintain aseptic conditions.

ISOLATION OF CAUSAL ORGANISM

The identification and diagnosis of the causal organism were carried out in the laboratory. The pathogen was cultured on petri dishes using sterilized potato dextrose agar (PDA) and malt extract agar (MEA) media, inoculated with surface-sterilized diseased parts of young plant tissues. After five days of incubation at 28 ± 2°C, a white, fluffy fungal growth was observed on the petri dishes. Microscopic examination was performed using slides prepared with lactophenol and cotton blue stain, viewed under an advanced research microscope, and photographs were taken. Identification was based on both macroscopic features like colony shape, color, texture, size, and appearance, as well as microscopic characteristics such as the presence of spore-bearing structures, spore size, growth rate of hyphae, septation in the mycelium, presence of specific reproductive structures, conidia shape and structure, and the presence of sterile mycelium. After the identification pure culture was stored in refrigerator for further use and preservation.

Fungi Collected From Study Sites:

SONBHADRA	MIRZAPUR	CHANDAULI
Ganoderma sp.	***Armillaria sp.***	***Lentinus levis***
Alternaria alternata	***Schizophyllum commune***	***Radulomyces molaris***
Drechslera sp.	***Microporus verniceps.***	***Pleurotus ostreatus***
Septoria arcuata	***Trichoderma viride***	***Pseudocercospora***
Cerotelium fici	***Fusarium***	***Aspergillus sp.***

Diseases Caused By Collected Fungi From The Study Sites:

Ganoderma sp.	Root Rot
Alternaria alternata	Leaf Blight
Drechslera sp.	Leaf Spot and Crown Rot
Septoria arcuata	Canker or Leaf Blight

Cerotelium fici	Rust
Armillaria sp.	Root Rot
Schizophyllum commune	Wood Rot or Trunk Decay
Microporus verniceps.	White Root Rot
Trichoderma viride	Seedling Mortality (Damping-off)
Fusarium	vascular wilts, root rots, and damping-off diseases
Lentinus levis	Instead of causing disease, Lentinus levis is involved in the natural decomposition pocess of dead w ood.
Radulomyces molaris	White Rot
Pleurotus ostreatus	White Spongy Rot
Pseudocercospora	Grey Leaf Spot
Aspergillus sp.	Rot and Molds

Discussion:

Overall, the study reinforces the critical importance of integrating pathogen identification, environmental monitoring, and management strategies to ensure the health, productivity, and sustainability of forest nurseries. By providing a detailed account of fungal diversity and ecology, this research lays the groundwork for more effective forest management policies, contributes to regional disease databases, and supports the long-term conservation of India's forest resources. The outcomes of this research are expected to benefit foresters, nursery coordinators, policymakers, and researchers by offering practical, evidence-based insights for managing fungal diseases and safeguarding forest ecosystems.

Conclusion:

The present study has systematically investigated the diversity, distribution, and pathogenicity of fungi affecting forest nursery plants in the districts of Sonebhadra, Chandauli, and Mirzapur. This research underscores the complexity of fungal ecology, highlighting the dual roles of fungi as both beneficial decomposers and potentially harmful pathogens. the study has provided a comprehensive overview of the prevalent fungal taxa, their morphological and microscopic features, and the environmental factors influencing disease prevalence. This research also illustrates that environmental and climatic factors, including relative humidity, rainfall patterns, temperature, and soil characteristics, are critical determinants of fungal prevalence and diversity. High humidity and moderate temperatures during the monsoon season were strongly correlated with peaks in foliar diseases, whereas variations in soil pH and texture influenced the dominance of particular fungal genera.

Powdery Mildew of Wild *Hibiscus*
chunar - Mirzapur

Pleurotus sp. *on Tamarind Tree*
Hathinala, Renukut (Sonebhadra)

Radulomyces molaris
Chandauli - Naugarh

References

- Alexopolous CJ, Mims CW and Blackwell M (1996) Introductory mycology (4th Ed), John Wiley and Sons publishers, Newyork, U.S.A. 868pp.
- Aneja KR (2007) Experiments in microbiology plant pathology and biotechnology (4th eds.), New age international publishers, New Delhi, 607pp.
- Barnett HL and Hunter BB (1972) Illustrated genera of imperfect fungi . 3rd edition, Burgess Publishing Co., 273 pp.
- Booth C (1971) Genus Fusarium. Commonwealth Mycological Institute (CMI), Kew, Surry, England. 273pp.
- Booth C (1977) Fusarium. Commonwealth Mycological Institute, Kew, Surrey, England. 58pp.
- Ellis MB (1971) Dematiacous Hyphomycetes. CMI, Kew, Surry, England. 608 pp.
- Ellis MB (1976) More dematiaceous hyphomycetes. Kew: Commonwealth Mycological
- Institute. 507pp.

- Gilman JC (1957) A manual of soil Fungi Revised 2nd edition Oxford and IBH publishing Co. 220pp.
- Nagmani A, Kunwar IK and Manoharachary C (2006) Hand book of soil fungi: In International Pvt. Ltd. New Delhi, 477pp.
- Raper K and Fennel DI (1965) The genus Aspergillus. Williams and Wilkins, Baltimore, USA, 686 pp.
- Raper KB and Thom C (1949) A manual of the Penicillia. Williams and Wilkins Co., Baltimore, Md 920pp.
- Subramanian CV (1971) Hyphomycetes An account of Indian species except Cercosporae. ICAR, New Delhi, 930pp.
- Verma RK, Sharma N, Soni KK and Jamaluddin (2008) Forest fungi of central India. International Book Distributing Co. Lucknow, 418pp.