

# Isolation and Morphological Characterization of Soil Fungi Associated with *Targionia hypophylla* from Melghat Region

Pornima D. Malviya

Department of Botany

Shri Vasant Rao Naik Mahavidyalaya Dharni, Dist- Amravati (MS) India

[malviyapornima@gmail.com](mailto:malviyapornima@gmail.com)

## Abstract:

The present investigation was conducted to isolate and characterize culturable fungi occurring in soil associated with the liverwort *Targionia hypophylla*. Soil fungi constitute an important component of terrestrial ecosystems and participate in decomposition, nutrient cycling and transformation of organic matter. Soil samples associated with *T. hypophylla* were collected from selected localities of the Melghat region of Maharashtra during late monsoon and winter. Fungi were isolated by the soil dilution plate technique and cultured on potato dextrose agar. Colony morphology and microscopic reproductive structures were examined using lactophenol cotton blue preparations. Four fungal species were identified based on cultural and morphological characteristics: *Alternaria alternata*, *Penicillium notatum*, *Mucor hiemalis* and *Curvularia clavata*. The study confirms the occurrence of several morphologically distinct fungal taxa in *T. hypophylla*-associated soil. The use of PDA proved suitable for recovery and characterization of the investigated fungi.

**Keywords:** *Targionia hypophylla*, Fungal isolation, Soil Fungi

## 1. Introduction

Fungi are among the most important microorganisms inhabiting soil. They perform essential functions in decomposition and nutrient cycling and may occur as saprophytes, parasites or resting propagules. Soil fungi can also interact with plants and other organisms occupying the same microhabitat. Isolation and identification of soil fungi traditionally rely on culture-based techniques. The soil dilution plate method is one of the commonly used approaches for recovering culturable fungal populations. Potato dextrose agar is frequently employed because it provides suitable nutritional conditions for growth of a broad range of fungi.

Bryophyte-associated soils may provide specialized microsites characterized by particular moisture, organic matter and temperature conditions. *Targionia hypophylla* is a liverwort occurring in seasonally dry and rocky habitats. The present study was therefore undertaken to isolate and morphologically characterize the fungi associated with its soil habitat.

## 2. Materials and Methods

Soil samples associated with *T. hypophylla* were collected from Chikhaldara, Ghatang and Semadoh in the Melghat region of Maharashtra. One gram of soil was suspended in 10 ml sterile distilled water and serially diluted. Selected dilutions were inoculated onto sterile PDA plates. Streptomycin was incorporated to suppress bacterial contamination. The plates were incubated at approximately  $28 \pm 2^\circ\text{C}$  and examined for fungal development.

Pure cultures were obtained and examined macroscopically. Colony colour, texture, growth rate and pigmentation were recorded. Microscopic structures were studied after preparing lactophenol cotton blue mounts. Identification was based on conidiophores, conidia, sporangia, hyphae and other diagnostic characteristics.

## 3. Results

Four fungal genus were isolated and identified on the basis of their colonies, morphology and microscopic characteristics.



**Fig: 1 *Alternaria alternata***



**Fig: 2 *Penicillium notatum***

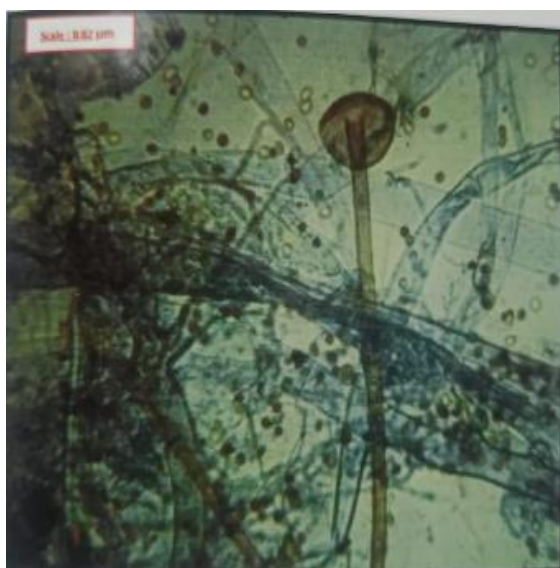


**Fig: 3 *Mucor hiemalis***

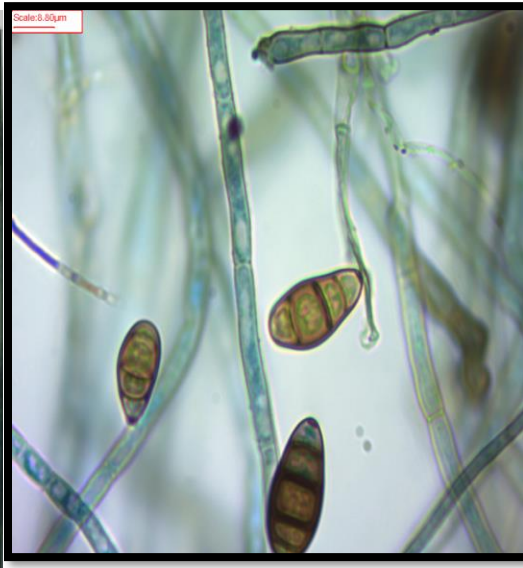


**Fig: 4 *Curvularia clavata***

### Morphological observations

The isolated fungi showed considerable variation in colony morphology and reproductive structures. Septate conidia of *A. alternata*, the black conidial heads of *P. notatum* and *M. hiemalis*, and *C. clavata* provided useful characters for identification. The culture period generally required several days for adequate development of diagnostic structures, with good growth observed within approximately 4–7 days under the conditions used.

**Table:1**

| Sr. No. | Species                     | Major diagnostic characteristics                           |
|---------|-----------------------------|------------------------------------------------------------|
| 1.      | <i>Alternaria alternata</i> | Olive-black colonies; muriform conidia in chains           |
| 2.      | <i>Penicillium notatum</i>  | Greenish colonies; penicillus-like conidiophores           |
| 3.      | <i>Mucor hiemalis</i>       | Globose sporangia; branched sporangiophores                |
| 4.      | <i>Curvularia clavata</i>   | Dark grey colonies; three-septate clavately shaped conidia |

### 4. Discussion

Culture-based isolation remains useful for studying the culturable fraction of soil fungi. However, it is important to recognize that culture-based methods do not recover the entire fungal community. Many fungi may remain undetected because of specific nutritional requirements, slow growth, dormancy or inability to grow under the selected culture conditions.

The Four fungi identified in the present investigation represent morphologically and ecologically diverse taxa. Genera such as *Penicillium*, and *Mucor* are commonly associated with decomposition of organic substrates. Other recorded genera, including *Alternaria* and *Curvularia*, contain plant-associated species. The findings agree with the general concept that soil constitutes a major reservoir of fungal diversity. The physical and chemical characteristics of soil, together with vegetation and climatic conditions, can influence fungal occurrence.

### 5. Conclusion

The soil associated with *Targionia hypophylla* supported eight culturable fungal taxa under the experimental conditions used. Morphological examination using cultural characteristics and microscopic structures permitted their identification. PDA was suitable for the isolation and characterization of the recovered fungi. Molecular identification and quantitative assessment should be incorporated in future studies to obtain a more comprehensive picture of fungal diversity.

### Acknowledgement

I would like to express my heartfelt gratitude to the Research center of Botany Department, Shri Vasantrao Naik Mahavidyalaya, Dharni, for providing the essential resources, valuable guidance, and conducive academic environment necessary for successfully carrying out this research work.

I also sincerely acknowledge the administration of Dayaram Patel Smarak Trust, Dharni, for their generous support and for providing the facilities, resources, and encouragement that contributed significantly to the successful completion of this research work.

### REFERENCES:

1. Barron, G.L. (1968). The Genera of Hyphomycetes from Soil. Williams and Wilkins.

2. Gilman, J.C. (2001). A Manual of Soil Fungi. Biotech Books, Delhi.
3. Hawksworth, D.L. (1991). The fungal dimension of biodiversity.
4. Kumar, S., & Singh, D. (2025). Medicinal Properties of Bryophytes. Diverse aspects of Ethnobotany, 266.
5. Mukhia, R. (2023). Bioprospecting for L-myo-inositol-1-Phosphate synthase from Cold Resistant Flora of Sikkim Himalayas: Partial Purification and Biochemical Characterization of the Enzyme from Hippophae Salicifolia D. Don (Doctoral dissertation).
6. Nagmani, A., Kunwar, I.K. and Manoharachary, C. (2006). Handbook of Soil Fungi. I.K. International.
7. NAMDEORAO, N. D. (2021). CHARACTERIZATION AND CLASSIFICATION OF SOIL FOR SUITABILITY AND ALTERNATE LAND USE PLANNING IN DHARNI TAHASIL OF MELGHAT DR (Doctoral dissertation, DR. PANJABRAO DESHMUKH KRISHI VIDYAPEETH).Shete, R. S., Kanade, M. B., & Chavan, S. J. (2025).
8. Nitin A Khandare. Traditional Herbal Medicines for the Treatment of Scorpion Sting by the Melghat Tribes., Int. Res. Journal of Science & Engineering, February, 2020, Special Issue A7 : 592-594. Bryophytes in a changing environment: an overview of biodiversity, ecological functions, climate effects and human pressures. Critical Insights in Plant Science, 1(1). <https://doi.org/10.1080/29932297.2026.2668241>
9. Nitin A. Khandare & Nandkishor K. More, 2025. "Medico-ethnobotany and Phytochemical Screening of Leonotis nepetifolia, Colebrookea oppositifolia from Melghat Region, Amravati District (M.S.)," International Journal of Scientific Research in Science and Technology, International Journal of Scientific Research in Science and Technology, vol. 12(7), pages 156-159, January.
10. Khandare, N. A. (2022). Medico-ethno botany and HPLC analysis of Capparis zeylanica Linn. from Western Melghat Region Amravati.(MS) India. IJIRT, 8(10), 598-601.
11. Waksman, S.A. (1922). Soil microbiological studies. Journal of Bacteriology, 7: 339–341.
12. Warcup, J.H. (1950). The soil-plate method for isolation of fungi from soil. Nature.