

ISOLATION AND IDENTIFICATION OF MUCOR (FUNGI) FROM GARDEN SOIL

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Abstract: This Study focuses on the usage of fold scope as a tool of research for identification of fungi species in soil samples collected from St. Ann's college for women. From the fungi isolation studies, it was found that mucor species were dominant. The students were guided to study the images by compound microscope and hand held fold scope so that they can study about biodiversity of fungi in various places with a hand held tool/ low cost/tool to become biotechnologist/microbiologist/scientist in their future endeavors.

Index Terms: Fold scope, Mucor, Compound Microscope, Educational Tool.

I. INTRODUCTION

Fungi are the microscopic cells that grow as long thread known as hyphae and they make efforts in pushing their way into the soil particles, roots and rocks. Fungi plays a crucial role in dynamics of water, cycling the nutrients and in suppressing the disease. They act as important disintegrators in food web. These fungi convert the complex organic materials into forms that organism can utilize. They enhance water infiltration and water holding capacity. Soil fungi are classified into decomposers (Saprophytic fungi) mutualists (the mycorrhizal fungi) pathogens/parasites. The present study has been conducted to encourage the students to carry out studies on fungi with low cost/free maintenance/eco-friendly handheld Foldscope.

The project on foldscope research and education tool was funded by DBT under Central Ministry of Sciences and Technology in partnership with Foldscope Instruments Inc. and Prakash lab (Stanford USA). Dr. D. Sirisha, Head, CECC, and JNIAS have received funding under DBT Fold Scope to use it as a research tool. In that context Dr. D. Sirisha along with the team has used this tool to study fungi and spread the importance of using microscope. Dr. D. Sirisha and team have given the fold scope to the biotechnology students and gauge motivation and interest of students when they use their own microscope.

II. DESCRIPTION OF FOLD MICROSCOPE AND ITS IMPORTANCE

Microscopes play an important role in modern science providing an essential, visual connection between familiar macro world and remarkable underlying micro world. Microscope has provided numerous imaging modalities with resolution approaching 250nm and smaller.

Before assembly of the fold scope:



After assembly of the fold scope:



III. MATERIALS AND METHODS

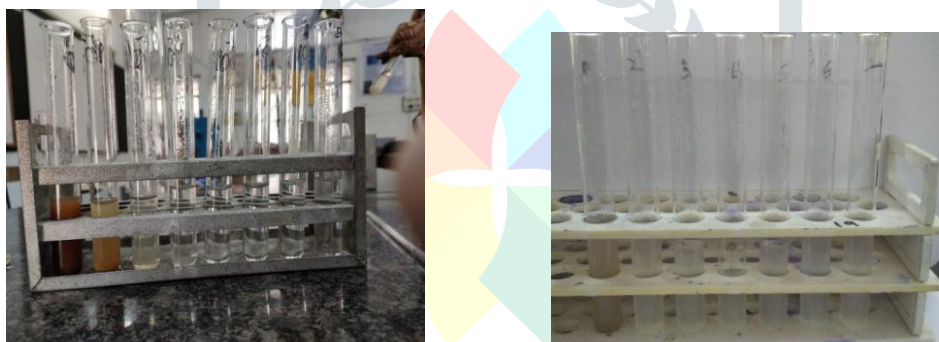
The soil samples were collected from the Garden of St. Ann's college for women. The soil is collected from the roots i.e. rhizosphere area. Soil samples (approximately 5 g) were collected into clean dry and sterile bags and with a sterilized spatula. The collected soil samples were brought to the laboratory and preserved for further studies.

IV. PREPARATION OF SOIL SAMPLES AND MICROBIAL CULTURE

1 gm of collected soil samples (soil –dilution method Waksman 1927) were diluted with 10ml of sterile distilled water and shake well for 20min to 30min to obtain uniform suspension of microbes. 1ml of sterilized suspension was added to petri plate (triplicates) containing sterile Potato Dextrose Agar (PDA). The plates were incubated at 37°C for 2 days and growth of fungi was observed. Fungus sporulates were seen. Spread plate technique has been employed to study the fungi.



COLLECTION OF SAMPLE



SAMPLE DILUTIONS



MEDIA PREPARATION

**STERILIZATION OF MEDIA**

V. STAINING OF FUNGI

The fungal propagules are either colorless or in different colors. Lacto phenol cotton method is employed to isolate/stain Fungi's Mucor. The stained specimens were observed under the optical microscope and foldscope under 10 x magnifications.

**MUCOR ON PETRI PLATE**

VI. RESULT AND DISCUSSIONS

**MUCOR ON OPTICAL MICROSCOPE****MUCOR ON FOLD SCOPE**

Running a demonstration/Running Season has benefitted the students by providing a means to their surrounding microscopic world. The team was successful in holding the attention of students which is the achievement of Dr. Prakash and team

VI. CONCLUSION

Students were excited to see the foldscope with a smart phone attachment. They were enthusiastic to study about the biodiversity in the college. They did not face hurdles in handling, in maintenance as it easy to operate with no need of electricity and they can carry in their hands. New and smart generation of microbiologists, environmentalists, biologists, and food technicians will be seen with a frugal innovation of microscope invented by the team of Manu Prakash, Stanford University.

VII. ACKNOWLEDGEMENT

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