

Bacteriological Profile of Common Lab Contaminants Responsible for Spoilage in Biological Laboratory

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ABSTRACT

In biological laboratories, contamination can arise from various sources, including airborne particles, equipment, reagents, and human error. Common contaminants responsible for spoilage in biological laboratories include bacteria, fungi, virus etc. Bacteria are ubiquitous in the environment and can contaminate laboratory samples, cultures, and media. There is a possibility of transferring microorganisms from one laboratory to the other during the course of activities that involves moving of materials. In this present work we had been identify three bacterial species like *Staphylococcus aureus*, *Klebsiella pneumonia*, *Enterococcus Sp.* which responsible for lab spoilage. Therefore measures like cleaning of lab, using protective gears, autoclaving of glassware needed to minimize lab contamination.

Keywords- Contamination, Biological lab, Spoilage, Bacteria.

I. INTRODUCTION

In biological laboratories, contamination can arise from various sources, including airborne particles, equipment, reagents, and human error. Common contaminants responsible for spoilage in biological laboratories include bacteria, fungi, virus etc. Bacteria are ubiquitous in the environment and can contaminate laboratory samples, cultures, and media. Common bacterial contaminants include species like *Bacillus*, *Staphylococcus*, and *Pseudomonas*. Fungal spores present in the air or on surfaces can contaminate cultures and media, leading to spoilage. Common fungal contaminants include species like *Aspergillus*, *Penicillium*, and *Candida*. Viral contamination can occur in cell cultures and viral stocks, posing a risk to laboratory experiments involving cell lines or viruses. Common viral contaminants include various strains of adenovirus, herpesvirus, and retroviruses. To mitigate contamination risks, laboratories implement strict aseptic techniques, maintain clean workspaces, regularly sterilize equipment and materials, and use appropriate

protective measures to minimize the introduction of contaminants. Additionally, quality control measures, such as regular testing for contamination and validation of experimental procedures, are essential for ensuring reliable results in biological research. Dash et.al 2011 reported bacteria responsible for spoilage in pharma lab.[1] Borst et al., 2004 reported contamination reduce quality of lab work.[2] Kosif and Avcioglu (2018), Isola and Olatunji (2016) told that contamination found in lab reagent.[3&4].

II. METHODOLOGY

Different products which were seemed to be spoiled and being kept in the Laboratories since long for experimental purposes were taken as samples for the present study to observe the microbial contaminants behind the spoilage. Than isolation of bacteria was done on Nutrient Agar plate by spread plate method was followed for isolation. 100 µl from each sample was transferred to the NA surface. It was then spread over the agar surface. The plates were incubated at 37°C for a

period of 24 hrs. The appearances of growth in the form of colonies were taken into account for further studies. After the isolation of bacterial strains on the Nutrient agar plates, the observation was taken visually with appearance of bacterial colonies on the surface of NA plates. The colonies were observed and grouped according to their distinguishing characteristics shown on the nutrient plate. One isolated colony from each group was taken and streaked on fresh Nutrient Agar plate to get the pure culture. Identification of bacteria was done by colony character, Grams staining and

biochemical test like IMViC (Indole, MR, VP, Citrate) test using standard procedures. [5]

III. RESULTS

Five types of colonies were selected over the agar plate for further study basing upon the distinguished morphology viz. I1, I2, & I3. The Staining and biochemical properties of isolates given on following table.

| Isolate | GRAM'S test | SHAPE | INDOLE | MR | VP | CITRATE | Suspected species |
|---------|-------------|--------|--------|----|----|---------|------------------------------|
| I1 | + | Coccus | - | + | - | + | <i>Staphylococcus aureus</i> |
| I2 | - | Coccus | - | - | - | + | <i>Klebsiella pneumoniae</i> |
| I3 | - | Rod | - | - | - | + | <i>Enterococcus Sp.</i> |

IV. CONCLUSION

Laboratory is contaminated through many means such as air, animal, or human agents when talking, sneezing, and coughing in the laboratory. There is a possibility of transferring microorganisms from one laboratory to the other during the course of activities that involves moving of materials. In this present work we had been identify three bacterial species like *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Enterococcus Sp.* which responsible for lab spoilage. Therefore measures like cleaning of lab, using protective gears, autoclaving of glassware needed to minimize lab contamination.

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