



ISSN: 2278 – 0211 (Online)

## Isolation And Identification Of Bacteria And Fungi From Soil Samples Of Different Industry Side In Dhaka City, Bangladesh

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### **Abstract:**

*Different kinds of soil sample have been collected from various industry sides in Dhaka city. The bacteria identified in the soil sample are Staphylococcus aureus, Escherichia coli, Pseudomonas sp. whereas in road side soil Aspergillus niger and Penicillium spp and in garden soil Mucor sp., Rhizopus sp. and Penicillium sp. were identified as fungus.*

**Key words:** Soil sample, Staphylococcus aureus, E. coli, Penicillium sp, Mucor sp

### **1.Introduction**

Soil is the upper layer of most of the earth's surface and varies in depth from inches to over twenty feet. It is a product of weathered rock, but quite distinct in its characteristic. Soils are excellent cultural media for the growth of many types of organisms [1]. This includes bacteria, fungi, algae, protozoa and viruses. A spoonful of soil contains billions of microorganisms. In general the majority of microbial population is found in the upper six to twelve inches of soil and the number decreases with depth [2]. The number and kinds of organisms found in soil depend upon the nature of soil, depth, season of the year, state of the cultivation, reaction, organic matter, temperature, moisture, aeration, etc. The traditional assessment of soil contamination is based on the regular routine of comparison of allowable threshold values with the results of monitoring. This approach is even a required action in environmental agencies, agricultural administration, and managing organization. Very often, solving a particular problem concerning the soil contamination or respective decision making is based solely on single results and not on a more generalized model about the state of the soil contamination in a certain region. This environmetric strategy makes it possible to detect relationships between the chemical pollutants and specific soil parameters, between sampling sites and, therefore, to achieve a stratification of the pollution [3].

### **2.Material And Methods**

Five Pharmaceutical industries (Green Pharmaceutical Ltd., Cosmo Pharmaceutical Ltd., Square Pharmaceutical Ltd., Health care Pharmaceutical Ltd. and Apex Pharmaceutical Ltd.) have selected for collection sites of soil samples. The soil samples were collected in sterile polythene bags from the premises of these pharmaceutical Industries, road side soil of Traffic area and Garden soil located in Tongi, Gazipur, Bangladesh. Winogradsky column was set to observe natural environment and its micro flora under lab conditions. Enrichment materials like CaCO<sub>3</sub>, CaSO<sub>4</sub>, K<sub>2</sub>HPO<sub>4</sub>, and filter papers (as cellulose material) are used [4, 5]. Isolation of bacteria was performed by making serial dilution of the taken samples and the dilution used for studies were 10<sup>-2</sup> and 10<sup>-4</sup>. The dilution was spread on Nutrient agar medium plates and media was weighed out and prepared according to the manufacture's specification, with respect to the given instructions and directions [5]. The plates were incubated at 37°C for 48 hrs. The Pure cultures were obtained based on the colour of the colony and the pure cultures of the bacterial isolates were subjected to various morphological and biochemical characterization tests to determine the identity of the bacteria isolates [6]. The morphological tests performed were Grams Staining, Endospore staining and Capsular staining. The set of Biochemical tests used in the identification of microorganisms is Catalase test, Oxidase test, Urease test, Coagulase test and IMViC tests. Isolation of Fungi was performed by making Pour plate method using Potato Dextrose Agar medium. The plates were incubated at 25°C for 4-6 days [8]. Pure fungal cultures were obtained and were identified by morphological structures observed by lactophenol staining under 100X lens.

### 3.Result And Discussion

The soil samples were analyzed with respect to different types of bacteria and fungi. The most common bacteria, *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas aeruginosa* are found in all the soil samples (Fig-1). But in the Industrial area, road side (Traffic area) samples, *Pseudomonas aeruginosa* was not observed. Similarly, when the soil samples are tested for different type of fungi, *Penicillium sp.* were found in all soil samples. *Mucor sp.* and *Rhizopus sp.* are found in (traffic area) road side sample and garden soil sample. *Aspergillus niger* was observed in Industrial sample (pharmaceutical industry) because of easily and abundantly available carbon source by-product. In the industrial area, roadside soil (traffic areas) soil samples, the minimum required nutritional conditions are not observed due to heavy metal pollution, such as lead, copper, nickel [4]. Even though oxygen is not prerequisite for the growth of *Pseudomonas aeruginosa*, at least  $\text{NO}_3$  must be available as respiratory electron acceptor which is minimum in these soil samples. *Escherichia coli* bacteria were highly present and *Pseudomonas spp* was lowly present in this study. Also present of *Aspergillus niger*, *Penicillium sp.*, *Mucors sp.* and *Rhizobium sp.* *Pseudomonas sp.* just was found in Pharmaceutical industry, but not found in road side (Traffic area) sample.

### 4.References

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