



Microbiology lab: water and soil microbiology

Prepared by :Dr.sarween O.Taha

For Environmental science students /stage 2

College of science

2023-2024

Lab:1

Introduction of microbiology

Microbiology: Microbiology is the study of the biology of microscopic organisms - viruses, bacteria, algae, fungi, slime molds, and protozoa.

Water microbiology: is the study of the micro-organisms that live in water, such as bacteria, fungi, yeast, viruses, protozoa and algae. In the water treatment industry, bacteria is the main micro-organisms of concern as some bacteria can be harmful to humans.

Bacteriological water analysis is a method of analyzing water to estimate the numbers of [bacteria](#) present and, if needed, to find out what sort of bacteria they are. It represents one aspect of [water quality](#). It is a [microbiological analytical](#) procedure which uses samples of water and from these samples determines the concentration of bacteria.

List of Instruments used in Microbiology Lab

Incubator: is a device used to grow and maintain microbiological cultures or cell cultures. The incubator maintains optimal temperature, humidity and other conditions such as the CO₂ and oxygen content of the atmosphere inside.

water bath: is laboratory equipment made from a container filled with heated water. It is used to incubate samples in water at a constant temperature over a long period of time.

Microscope: is a laboratory instrument used to examine objects that are too small to be seen by the naked eye. Microscopy is the science of investigating small objects and structures using a microscope. Microscopic means being invisible to the eye unless aided by a microscope.

Autoclave 121°C for 15-20 minutes under 15 pound/inch² (psi) or (1 bar). Sterilize heat resistant materials, eg. Some media, liquids, papers, glassware, heat resistant plastics, cotton, gauzes, bandages, ...etc.

Oven 50-200°C for different times according to the material to be sterilized. Sterilize heat resistant materials, eg. Glassware, oil that cannot be autoclaved (steam do not penetrate it) and metals which can be corroded by steam.

Incineration (Bunsen burner) 800-1800°C for few seconds. Sterilize loops and needles, test tube mouth. Also it is a common method used in hospitals for burning of syringes, beddings and pathological samples.

Hood Sometimes provided with UV lamp. A sterile chamber for transferring and subculturing of microorganism.

Refrigerator 4°C or below. Preserve cultures from contamination and permit a maximum survival rate for microorganism without growth and reproduction.

Sensitive balance Weighting of materials and media. Glassware Different purposes. eg. beakers, conical flasks, tubes, Durham tubes, pipette, pipette box,etc.

Spectrophotometer Different wave length. Reading absorbance, transmission and concentration of different samples.

Centrifuge Has a chamber for tubes. Concentrating of samples and collecting of precipitates.

..... others

Equipments/instruments required for microbiology laboratory

