

**Department of biology**

**((Invertebrates ))**

**2 stage**

**Lab 3**

**Sterilization and Disinfection**

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**Sterilization and Disinfection**

**Sterilization:** refers to any process that effectively kills or eliminates all microorganisms (such as bacteria, fungi, viruses and including spore forming, etc.)from a surface, equipment, article of food or medication, or biological culture media.

**Disinfection:** refers to reduce the microorganisms as far as possible except bacterial spores.

**Sterilization Methods**

Sterilization methods are divided into physical and chemical methods

Physical sterilization methods

A. Heat: Different types of heat application include

1-Dry heat

1) 1-Direct flame: Leaving the loop or (needle and forceps) in the flame of

a Bunsen burner until it glows red ensures that any infectious agent gets

inactivated.

2-Hot air oven: which requires use of higher temperatures (150-180°C)

for 1-3 hrs., can be used only with glass or metal objects (glass petri

dishes, pipettes, test tube and flasks, etc.)

2. 2- Moist heat: kills by protein coagulation (denaturation), the moisture must

penetrate to pathogens so it effective

1) Pasteurization: sterilization by moist heat less than 100°C which 1-

sterilize serum, body fluids (lymph) and milk.

2) Boiling: at 100°C, kills many vegetative cells and viruses, which 2-

sterilize (glass syringe and syringes needle).

3) 3-Autoclave: steam applied under high pressure (15 lbs/in2 ) (121°C for min) is the most effective method of moist heat sterilization, which

15 sterilize (culture media, normal saline, distilled water and clothes, etc.).

B. Radiation

Ultraviolet radiation: UV is good for disinfecting surfaces and air 1-

(hospital wards, operations rooms and microbiological laboratory, etc.)

. 2-Ionizing radiation: like gamma and x ray which have ability to penetrate material so it effective to sterilize material sensitive to heat like drug plastic articles and in synthesis of food.,

C. Filtration: use to sterilize biological fluids (such as serum, plasma, antibiotic solution, enzyme solution, sugars and vitamin solution).

**Chemical sterilization methods**

**Disinfectants:** are antimicrobial agents that are applied to non-living objects to destroy all microorganisms except endospores and viruses.

**Antiseptics:** are antimicrobial substances that are applied to living tissue or skin to reduce the possibility of infection, sepsis or putrefaction

**The chemical antimicrobial agents are**

1-Ethanol (70%): its kill (\*cidal) and inhibit the growth (\*\*static) of

microorganisms and good for hands sterilization and other parts of the body

2-Phenol. (2-5%): use to sterilize the floor and table surface

 wounds sterilization 3-Iodine.

4-Glutaraldehyde and Formaldehyde: its sporicidal which sterilize surfaces and floors .

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\* \*If kill bacteria called (bactericidal) or fungi (fungicidal) or virus (veridical), etc.

\*\* If inhibit bacterial growth called (bacteriostatic) or etc