

2.2. APPARATUS

The laboratory should have following apparatus :

(1) **Weighing balance.** For measuring different material starting from potato to minute amount of chemicals, weighing balance is necessary. The balances are of three types : pan balance, chemical balance and electric balance. The first two balances should be in the laboratory.

(2) **Microscope.** This is an essential apparatus for every biological laboratory. Generally compound and dissecting microscope (Fig. 2.4) are used for this purpose.

(3) **pH meter.** This instrument is used for determination of the nature of media during preparation of culture solution.

(4) **Autoclave or domestic pressure cooker.** This apparatus is used for melting agar, for sterilizing petridishes and glass wares and for sterilization process.

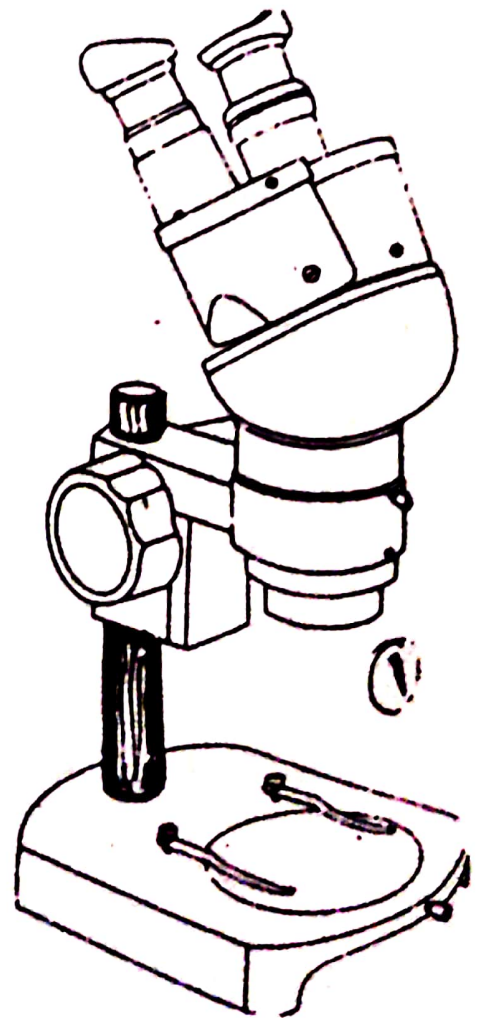


Fig. 2.4. A dissecting microscope.

needed for culture works. The materials are heated by steam at 15 lb pressure in 120°C kept for 10 minutes.

(5) **Hot air oven.** The oven is required for drying the glass goods. The glass goods should be kept in trays (enamelled tray) and then placed inside the oven.

Refrigerator, vacuum pump, heater etc. are also useful apparatus.

(6) **Hot plate-cum magnetic stirrer** are used in dissolving chemicals.

(7) **Exhaust pump** is required to facilitate filter sterilization. Bacterial filtration process is also used (Fig. 2.5).

(8) **Laminar air flow cabinet** (Fig. 2.2) is an important apparatus for aseptic cultures.

(9) **Flame instruments** like spirit lamp or bunsen burner are used for working with cultures.

(10) **Forceps**-large and small with blunt ends are used for inoculation and subcultures.

(11) **Instruments stands**, trolley with suitable trays forceps, fine needles, wire-mesh baskets etc. are also important items in the laboratory.

(12) Glass materials :

- (a) *Flasks of various sizes*—100 ml, 250 ml, 500 ml wide mouthed chemical flasks are used in different cultures.
- (b) *Volumetric flasks*—(500 ml, or larger) are required to make standard volume of the media or solutions.
- (c) *Culture vessels*—The glass vessels used for culture is known as culture vessel. Different types of vessels have been used and the choice of the vessel is dictated by the nature of the experiment. Wide mouthed glass bottles of different sizes have been used. Borosilicate or pyrex glassware should be used. Petridishes culture tubes, screw cap bottles are culture vessels.

The vessels should have suitable closures (cotton plugs, stoppers, aluminium and stainless steel cap). The closures must be effective in preventing moisture loss from the vessels and also does not inhibit the growth of the cultured plant material.



Fig. 2.5. Bacterial filtration process.

Now-a-days, the glass culture vessels have been replaced by suitable plastic ware. Some of the plastics are autoclavable and the vessels are used in tissue culture laboratories.

(d) *Measuring cylinders*—(25 ml, 50 ml, 100 ml etc.), graduated pipettes (1 ml, 2 ml, 5 ml, 10 ml.) etc are important glass goods.

(13) Autoclave. The laboratory apparatus designated to use steam under regulated pressure is called an autoclave. It is essentially a double jacketed steam chamber equipped with devices which permit the chamber to be filled with saturated steam and maintained at a designated temperature and pressure for any period of time. In the operation of an autoclave it is absolutely essential that the air in the chamber be completely replaced by saturated steam. If air is present, it will reduce the temperature attained within the chamber substantially below that which would be realised if pure saturated steam were under the same pressure. It is not the pressure that kills the organism but the high temperature of the steam. Generally the autoclave is operated at a pressure of approximately 15 lb/m² (120°C).