Mark-Capt-7 ⑤

1. Pharmaceutical Significance of Bacteria :-

(1) Bacteria used to produce various Antibiotics by fermentation process

1. Tetracyclines - Streptomyces aureofaciens.
2. Oxytetracyclines - S. griseoflavus.
3. Streptomycin - Streptomyces griseous
4. Actinomycetin - S. erythreus
5. Rifambicin - Nocardio mediternea.

(2) Production of Alcohol.

Alcohols are produced during the fermentation effected by bacteria.

eg. Bacillus granulobacter - butanol, acetone.
Clostridium thermocellum - ethanol.

(3) production of various acids

Lactic acid - Lactobacillus delbrucki
Lactobacillus bulgaricus
Citric acid - Bacillus Subtilis.
Butyric acid - clostridium sp.

4. production of polysaccharide.

eg. Dextron - Leuconostoc mesenteroides.
Pseudomonas sp.

5. Bacteria used as a Bioinsecticides.

eg. Bacillus thuringiensis.

6. Bacteria used for Biodegradation & Xenobiotic process to destroy various metalic elements in sewage.

⇒ P. putida.

15. Validation of sterlisation process.
   1. Steam sterlisation — Bacillus stearothermophilus
   2. Dry heat sterlisation — Bacillus subtilis.
7. production of vitamins. Ionising radiation - Bacillus pumilus.
   Filtration — Serratia marcescens.
   Vitamin B_{12} (cyanocobalamin) — Streptomyces olivaceus.

8. production of Enzymes.

   (I) L. asparaginase — pectobacterium Carotovorum
   Bacillus Circulans.

   (II) B. lactamases — Bacillus Cereus

   (III) Streptokinase — Streptococcus sp.

   (IV) Streptodornase — Streptococcus sp.

9. Used as ~~bioinsectidies to replace pests to~~ chemical insecticide.
   e.g. Bacillus thuringiensis against moths, beetles, flies, butterflies, mosquitoes,

3. production of vaccine.

   1. Diphtheria vaccine — Corynebacterium diphtheriae

   2. cholera vaccine — Vibrio cholerae.

10. Act as biological indicator to validate sterilization process.

   1. steam sterlization — Bacillus Stearothermophilus.

   2. Dry heat sterilization — Bacillus Subtilis.

   3. Filtration — Serratia marcescens.

11. r DNA technology:-

   Bacterial plasmids widely used in recombinant DNA technology.

   & produce various hormones vaccine, Enzymes, serum etc.
   Monoclonal Antibodies. & Gene cloning Experiments.

12. Nitrogen fixation ~~from~~ for plant from Atmosphere Nitrogen.

13. It is used to Synthesis of amino acid like
   Lysine — Corynebacterium glutamate.
   Glutamic acid — Micrococcus sp.

14. Production of Dextran (plasma Substitute) Leuconostoc mesenteroides

2 Pharmaceutical Significance of fungi.

1. production of Antibiotic.
   1. Penicillin — Penicillium rubratum
   2. Cephelosporin — Cephalosporium aeremonium
   3. Griseofulvin — Penicillium griseofulvum. Penicillium patulum.
2. Production of various acids,
   1. Citric acid — Aspergillus niger
   2. Lactic acid — Rhizopus oryza
   3. Gluconic acid — Aspergillus niger.
   4. Malic acid — Aspergillus fumaricus.
   5. Tartaric acid — Acetobacter suboxydens.
3. production of vitamins.

   Vitamin B_2 – Riboflavin – Ashbya gossypii
4. Bio transformation proces.

   Progesterone $\xrightarrow{\text{Rhizopus nigricans.}}$ 11 α hydroxy progesterone.
5. production of various important Enzymes.
   1. α - Amylase — Aspergillus sp.
   2. protease — Penicillium sp.
   3. Lactase
   4. pectinase
   5. Glucose isomarase
   6. Amyloglucosidase.

6. production of various Alkaloids.

ex. ergometrine — Claviceps purpuriae
Claviceps paspali

7. Production of alcohol.

⟹ Saccharomyces Cerevisiae.

8. producing wine.

S. Cerevisiae
S. fermentati.

9. yeast is used as food
eg. Candida tropicalis
Kluyveromyces fragilis.

10. production of antiinflamatory drug.

eg. cyclosporine — Tolypocladium inflatum.

Pharmaceutical significance of Algae.

1. It is used to produce various commercial pdt.

carrageenan - used in Food industry, dairy industry.

- Eucheuma Cottonii
  Eucheuma spinosum

2. Alginic acid — to make creams, polymer prepara..
   - brown Algae Macrocystis, Laminaria.

3. Agar - Red Algae - Gelidiaceae.

Pharmaceutical significance of virus.

Pharmaceutical Significans of protozoa:

Protozoa is capable of various pharmaceutical products. It play a major role in the maintenance of ecological balance and clinically responsible for various disease.

1. Role in ecological balance:-

It serve as a food for large marine organism and maintain the food chain in ecological balance.

2. Used in Xenobiotic & biodegredation:-

Protozoa are widely used in the biodegredation processes by destroying man-made waste compounds,

protozoa like paramecium, Vorticella, Aspidisca are employed for sewage treatment for aerobic metabolic process.

It is used to digest vegetative animal matter, grease, oil & acid present in water. It is also used to remove various organic & Inorganic matter in water.

3. Used in molecular biology:

It is used in various molecular biology research studies especially study of cell cycle, Synthesis of nucleic acids.

4. Diseases produced by protozoa.

It will produce various disease for humans, animals and plants.

Eg.

1. Entamoeba histolytica — Amoebic dysentery.
2. plasmodium vivax — Malaria.
3. Giardia lamblia — Giardiasis (Intestinal infection) diarrhea, nausea, abdominal discor

Pharmaceutical Significans of virus:

Virus are intracellular parasite, Contain a genetic material Could be either DNA (or) RNA.

1. production of vaccines:-

			Cell line
ex. Oral polio vaccine	—	Sabin	Kidney cell.
Killed polio vaccine	—	Salk.	
~~It is used the~~ Hepatitis	—	rDNA technique	Cow Kidney.

Some viruses were used to prepare various dead (or) attenuated vaccines.

Influenza	—	Inactivated virus — chick embryo
Measles	—	Live attenuated —— "
Mumps	—	Live attenuated —— "

2. Used as vectors in rDNA technology.

Some viruses were used as vectors in the pdn of ~~antibodies~~ vaccines (Hepatitis, Influenza), Hormones, Enzymes, Monoclonal antibodies.

3. Used as Bio insecticides.

The viruses can be used as an insecticide against the insects & pests.