

Medicinal Plants including microbes.

- 1) 70,000 medicinal plants 2) 500 plants have been studied.
3) India :- 1100 species used in different systems of medicine.

Biomedicines:- Medicinally valuable compounds obtained from the plants.

Examples:

Sl.No.	Medicine	Plant	Uses
1.	Morphine	<i>Papaver somniferum</i> (opium poppy)	Strongest pain killer
2.	Qinine	<i>Cinchona officinalis</i> <i>Cinchona calisaya</i>	i) Antimalarial drug ii) controls all types of fever
3.	Digoxin	<i>Digitalis</i>	Treat heart diseases
4.	Ephedrine	<i>Ephedra sinica</i>	Treat cough
5.	Ginseng	<i>Panax ginseng</i>	Mental and physical stress relaxing drug

MICROBES IN MEDICINE

Antibiotics:- The substance produced by a living organism, which inhibits the growth and metabolic activities of pathogenic organisms without affecting the metabolism of host.

Sl.No.	Antibiotic	Plant/ Bacteria (Fungi)	Uses
1.	Penicillin	<i>Penicillium notatum</i> (Blue green mould)	Effective against Gram-positive bacteria
2.	Streptomycin	<i>Streptomyces griseus</i> (filamentous actinomycetes)	Cures urinary infections, tuberculosis, meningitis, pneumonia
3.	Aureomycin	<i>Streptomyces aureofaciens</i> (Actinomycetes)	Treatment of osteomyelitis, Whooping cough, eye infections
4.	Chloromycetin	<i>Streptomyces Venezuelae</i> (Actinomycetes)	Cures typhoid and kills bacillus bacteria
5.		<i>Aspergillus fumigates</i> (Fungi)	Used against typhoid and dysentery
6.	Bacitracin	<i>Bacillus licheniformis</i>	To treat syphilis, diabetes
7.	HORMONE -HUMULIN	<i>E.coli</i>	Insulin production (humulin) treat diabetes

Bacillus subtilis produces 60 different antibiotics.

CROP DISEASES AND CONTROL

1. Prophylaxis:- Protection of the host from exposure to the pathogen, from infection/ from environmental factors favourable to disease development.

2. Disease resistance:- Improvement of resistance of the host to infection and to disease development.

SPECIFIC DISEASES

Sl.No.	Disease,Causal agent, class affected plant	Pathogen Characters	Symptoms	Control Measures
1.	a) Blast disease of Rice b) <i>Pyricularia oryzae</i> c) Deuteromycetes d) Paddy(Rice) Collateral Host <i>Digitaria marginata</i>	<i>Pyricularia oryzae</i> i) Septate - mycelium ii) Olive brown colour iii) Conidium with basal appendage	a) green-necrotic lesions on the leaf blade rachis b) Drying of the leaves, seedlings wither and die c) After transplantation necrotic lesions appear in leaf lamina and leaf sheath	a) cultivation of disease resistant, high yielding varieties b) Plant debris should be collected and destroyed. c) Seed treatment:- Immersion of seeds In 0.2% solution of Kalimat-B (24 hours) d) Application of seed protectants cerasan, spergon and agrosan GN e) Sparying BORDEAUS mixture f) Organo mercuric compound dustings
2.	a) Tikka disease of ground.nut b) <i>Cercospora personata</i> c) Deuteromycetes d) Ground nut	<i>Cercospora personata</i> i) Septate branched brown colour mycelium ii) haustoria absorb food materials from the host tissue iii) Each conidiophores produces single conidium iv) conidia dispersed by wind	a) Lesions on the leaves in July b) Lesions are darkbrown/Black in colour(1-6 mm in dia) c) Yellow halo develops around the spot (lesions)	a) Sanitation and Crop rotation b) Sowing of resistant varieties c) Effective measure - Sulphur dusting d) Disease reduced by the use of phosphatic and potassic manures.

Sl.No.	Disease,Causal agent, class affected plant	Pathogen Characters	Symptoms	Control Measures
3.	a) Citrus Canker b) <i>Xanthomonas Citrii</i> c) Schizomycetes d) Citrus	<i>Xanthomonas Citrii</i> a) Commonly found during the rains b) usually affects the leaf, twigs, thorns and fruits. c) Entry: through stomata and wounds d) Multiplication in the cortex	a) Brown scabby spots surrounded by dark-brown glossy margins in all green parts and maturing fruits. b) The lesions may enlarge to a diameter of 3-4 mm and turn brown	i) Spraying Bordeaux mixture ii) Removal of infected branches iii) Streptocycline antibiotic spray 3-4 times in a season
4.	a) Tungro disease of Rice b) Rice Tungro Virus c) Paddy d) Vector / transmitter of virus leafhoppers	Rice Tungro Virus	i) Mild interveinal chlorosis (emerging leaf) ii) Mild mottling, Yellowing iii) Stunted growth iv) Dark brown spots on the leaves	

BORDEUX MIXTURE FORMULA

- i) Copper sulphate :- 9 Kgs
- ii) Quick lime :- 9 Kgs
- iii) Water :- 250 litres

BIOPESTICIDES

1. Biological agents that are used for control of insects, weeds and pathogens produced from living organisms are called biopesticides.
2. Bio pesticides are obtained from viruses, bacteria, fungi, protozoa and mites.
3. The suitable preparations from micro organisms for control of insects are called as microbial insecticides.
4. The most frequently used bio-control agent is *Bacillus thuringiensis*, Pyrethrum from *chrysanthemum* (Asteraceae family Plants)

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5. Advantages of microbial insecticides:-

- a) Non-hazardous , non-phytotoxic and are selective in action
- b) Eco- friendly
- c) Not responsible for environmental degradation.

6. *B.thuringiensis* bacterium is harmful to Lepidoptera insects because it secretes several toxins such as exotoxins and endotoxins in crystallized form.

7. Side effects of chemicals used as insecticides/ pesticides

- a) Serin (Carbaryl) → Kill more than 100 types of insects attacking 100 different crops.(useful / harmful)
- b) Bringing about considerable damages to living organisms and environment.

COMMONLY AVAILABLE MEDICINAL PLANTS

Sl.No.	Botanical Name , Family	Vernacular Name	Trade Name	Habit	Uses
1.	<i>Acalypha indica</i> (<i>Euphorbiaceae</i>)	Kuppaimeni/ Ponnamayaki	Indian acalypha	i) Herbs ii) Ovate leaves iii) axillary spike inflorescence iv) unisexual flowers	a) Leaf Paste → treat burns b) Leaf Juice + lime → used to cure ringworm disease c) Powdered leaves → Cure bed sores, Infectious wounds d) Leaf fresh juicet + Oil + salt → scabies, Rheumatid arthritis. e) Medicinal compound: Acalyphine, Triacetohamine, cyanogenic glucoside + alkaloids
2.	<i>Aegle mrmelos</i> (<i>Rutaceae</i>)	Vilvam	Baer fruit.	i) Aromatic tree ii) Tri (or) Penta floicate leaves are Present iii) Sweet scented flowers are present iv) Axillary panicles are present	a) unripe fruit: Uses: → Stomach indigestion → Kills internal parasites → Cure chronic diarrhoea → Tonic for the betterment of heart and brain b) Medicinal compounds:- Marmelosin , coumarin, and triterpenoids.

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Sl.No.	Botanical Name, Family	Vernacular Name	Trade Name	Habit	Uses
3.	<i>Cissus quadrangularis</i> Vitaceae	Priandai	Hadjor bone joiner	i) Shrub with tendrils ii) Angular winged stem iii) Leathery, Simple leaves iv) chemicals in the Plant: (Steroids) Presence, tetracyclic triterpenoids	a) Paste from the powdered stem, → bone fracture b) Whole Plant → treat asthma stomach trouble c) Stem → treatment of piles and of nose
4.	<i>Mimosa pudica</i> Mimosaceae	Thottal Chirungi / Thottal surungi	Touch me not	i) Small herb with prickles ii) Leaf left arranged in two rows iii) Axillary head inflorescence iv) pink coloured flowers v) Leaves are sensitive to touch	a) An alkaloid mimosine extracted from plant b) root extract → relieve asthma, diarrhoea c) Plant → Curing Piles, whooping minor skin wounds
5.	<i>Solanum nigrum</i> Solanaceae	Manithakkali / Manathakkali	Black night shade	i) Annual branched unarmed herb ii) ovate leaves iii) extra axillary cyme iv) Black coloured Berry fruit	a) herb extract: treatment of cirrhosis liver b) Plant body → cures fever, dysentery and promotes urination c) Medicinal compounds: Solanin, solanigenin