

Micro-Organisms

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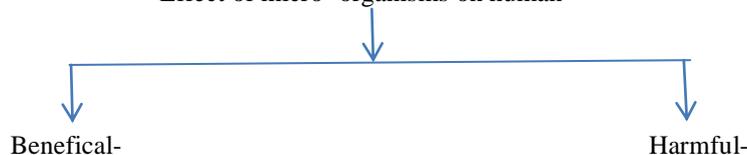
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Branch of biology in which we study of micro-organisms is called microbiology.

Micro-organisms include- (1) Bacteria

- (2) Viruses
- (3) Fungi
- (4) Protozoa
- (5) Algae

Effect of micro-organisms on human



(1) In Food-Bread, Food spoilage and bacterial, viral, fungal diseases. Wine cheese, yoghurt, vinegar.

(2) Industrial application-Enzyme, Amino acids, vitamin, antibiotics, vaccine, Sewage treatment

(3) Agriculture- Recycling element, Nitrifying bacteria.

(1) BACTERIA- Bacteria is discovered by ANTONI VAN LEEUWENHOOK.

Size of bacteria- 0.2-1.5 micrometer

Shape of bacteria-

- (1) Bacillus-Rod shaped
- (2) Coccus- Spherical shaped
- (3) Spherillum-spiral shaped
- (4) Spirochoete- Corkscrew shaped
- (5) Vibrio- Comma shaped
- (6) Pair of cocci- two coccus bacteria link together

Smallest bacteria is DIALISTER PNEUMOSINTES (0.15-3 micrometer)

Largest bacteria is THIOPHYSA VOLUTAN (18 micrometer)

Gram positive bacteria- Those bacteria when they are stained in gram stain result in purple colour.

Example-Staphylococcus aureus, Hay bacillus.

Cell wall composed of peptidoglycan, lipid, Teichoic acid.

Gram negative bacteria- Those bacteria when they are stained in gram stain result in Pink colour.

Example-E.coli, Meningococcus.

Cell wall composed of peptidoglycan, outer membrane of lipid, protein, lipopolysaccharide(LPS).

In bacteria, pilli also help in reproduction during conjugation.

Anaerobic bacteria- Oxygen is not required.

Aerobic bacteria- Oxygen is required.

Asexual reproduction by binary fission and endospore.

Nutrition of bacteria-

Autotrophic- Synthesize their own food.

Heterotrophic- Not synthesize their own food.

Symbiotic- Have mutual benefit from other organism.

Parasite- Present in Plants, Animals, and Human being.

Bacterial diseases-

Tuberculosis, Anthrax, Tetanus, Leptospirosis, Pnumonia, Cholera, Balalism, Psedomonas

Infection, Meningitis, Gonorrhoea, Bubonic plague, Syphilis.

Symptoms of bacterial diseases-

- (1) Bloody urine and painful urine
- (2) Frequent Urination
- (3) Diarrhea
- (4) Irritability
- (5) Fatigue, Fever, Sore throat, head ache, cough

- (6) Irritability
 - (7) Nausea and vomiting
 - (8) Pain such as joint and ear or abdominal pain
 - (9) Rashes
 - (10) Lesions
 - (11) Abscesses
 - (12) Stiffness
 - (13) Weakness
- Serious symptoms-
- (1) Confusion
 - (2) Deep, wet chest that produce yellow green or brownish phlegm
 - (3) Difficult to breath
 - (4) High fever (>101⁰F)
 - (5) Leathargy
 - (6) Seizure

Antibiotics-

- (1) Aminoglycoside,
- (2) cephalosporia,
- (3) macrolides,

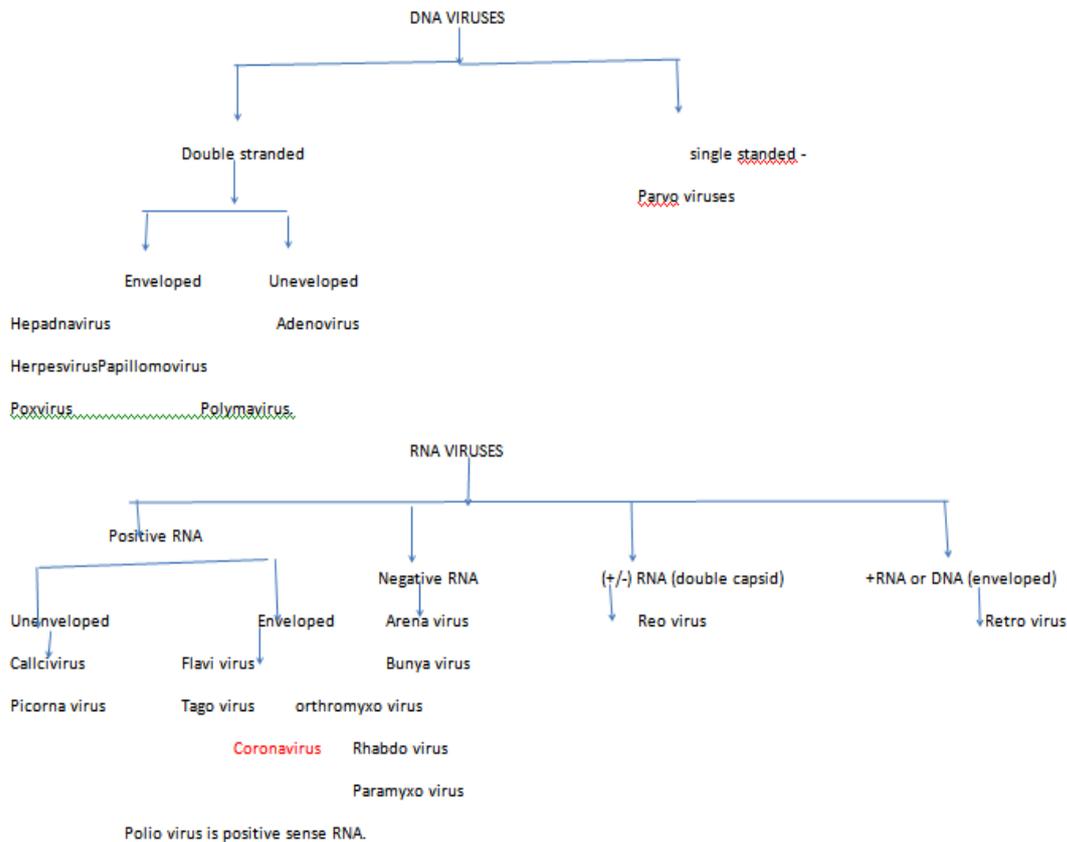
Complication-

- (4) penicillins,
 - (5) quinolones,
 - (6) tetracyclines.
- (1) Coma kidney failure
 - (2) kidney failure
 - (3) Septic amide
 - (4) Severe dehydration and electrolyte imbalance
 - (5) Shock
 - (6) Toxic shock syndrome

(2) VIRUSES-

Viruses is discovered by DEMITRIVENAVSKY
 Size of viruses- 0.015-0.2 micrometer

Not grow in artificially
 Example- Tobacco mosaic virus, Adenovirus, Influenza virus, Bacteriophages.



Viral diseases-

Chicken pox, flu (Influenza, Herpes, HIV, Human Papillo virus (HPV), Infection mononucleosis, Mumps, Measles, Rubella Shingle, Viral gastroenteritis(stomach flu),Viral Hepatitis, Viral hepatitis, viral meningitis, Viral pneumonia.

Symptoms of viral infection-

- (1) Flu like symptoms (Fatigue, fever, sore throat, headache, cough, aches, pains)
- (2) Gastrointestinal disturbances such as diarrhea, nausea and vomiting.
- (3) Irritability
- (4) Malaise(General ill feeling).
- (5) Sneezing
- (6) Swollen tonsils.
- (7) Stuffy nose, Nasal congestion, Runny nose.
- (8) Unexplained weight loss.

Some serious symptoms of viral infection-

- (1) Change in level of consciousness.
 - (2) Chest pain.
 - (3) Deep, wet chest cough that produce yellow, green or brownish phlegm.
 - (4) High fever (>101⁰F).
 - (5) Lethargy.
 - (6) Seizur.
 - (7) Shortness of breath, wheezing or difficult to breath.
 - (8) Stiffneck.
 - (9) Yellowish skin and white of eye (Jaundice).
- 3) Fungi (Yeast) - 5-10 micrometer.
 Manufacture of alcoholic beverage.
- 4) fungi (Mold) - 2-10 micrometer.
 Cultivated it both artificial or naturally.

VACCINES OF COVID-19

NAME OF COUNTRY	NAME OF VACCINE
INDIA	CIVISHIELD, COVAXIN
GERMAN	MODERNA, PFIZER
RUSSIA	SPUTNIK V

Scientists and their researches

Scientist	Research (Discoveries)
Kirchor	Reported finding minute worm in blood of plague patient.
AgostinoBassi	Muscardin diseases of silk worm caused by fungus.
Alexander flaming	Discovered first antibiotic.
Emile Roux and alexander Yersin	Discovered diphtheria toxin.
Joseph Hansen	Discovered leprosy bacillus.
Alexander Ageston	Discovered staphylococcus.
Caynebacteriumdiptheriae	Discovered cause of diphtheria.

Scientist	Research (Discoveries)
Louis pasture	Discovered that development of rabies.
Good Pasture	Cultivation of viruses in chick embryos.
Van Behring and Kitasato	Vaccine against diphtheria and tetanus.
Furthermore metchnikoff	Role of phagocytic cell in defense.

Scientists got Nobel Price for his research or discoveries-

Scientist	Research (Discoveries)
Sir Ronald Ross (1902)	Transmission of Malaria
Robert Koch (1905)	Research of Tuberculosis.
Ilyamarkov (1908)	Work on immunity and phagocytosis.
Alexander Fleming (1945)	Discovered penicillin.
James Watson and Crick (1962)	Structure of DNA
Stanley Benjamin Prusiner (1997)	Prior research
HaraldzurHausen (2008)	HIV viruses



Some fathers of micro-biology –

Scientist	Father of
Louis pasture	Microbiology
Jason Lister	Antiseptic surgery
Robert Koch	Bacteriology
Paul Ehrlich	Chemotherapy

References- Pharmaceutical Microbiology book ofNiraliPrakashan.