MMB -C101
VEDIC AND MODERN MICROBIOLOGY

L T Credit
3 1 4

Learning objectives:

- To understand the Vedic culture in which there is description of different technique related to microorganism and also they will know how earth evolve and also know the landmarks discoveries of microbiology
- To acquire knowledge of different technique to stain microorganism and how they can visualize the microorganism in different types of microscopes.
- To acquire an overall knowledge on the morphology and functions of the structures with the prokaryotes and eukaryotes.
- To become familiar with general characteristic of prokaryotic and Eukaryotic cell and also acquire knowledge of cellular organization, life cycle and economic importance of Prokaryotic

Learning outcomes:
At the end of course student will be able

- To know the different milestone in the history of microbiology, importance of Vedic microbiology and scope of microbiology
- To understand and know the application of techniques used in the field of Microbiology.
- Identify key constituent prokaryotes cell and their functions.
- To classify the prokaryotic cell by conventional as well as modern methods.
- To stain the bacteria with simple, differential and special stains.

UNIT – I

Vedic Microbiology: Introduction to Vedas- Types and great saying of Vedas; Aryans- definition, indigenous or invaders; Rishi Kanva- the Father of Vedic Microbiology; Cosmogony; Vedic concept of origin of life; Vedic period; Vedic classification of Krimis- classification by Charak; shape and colour of germs (Krimis); occurrence of germs (Krimis)in the environment- on animals, body surface of human, water whey, milk, food grains; knowledge of invisible germs through logic and Devine Eyes; classification of germs (Krimis)- major groups of Krimis- Drishta, Adrishta; Various names of the krimis in Vedas and in Charaka Samhita; colours of Krimis as in Vedic texts; different terms used for microbes- Amīva, Durnāmā, Sunāmā, Yādudhān, Piśāca, etc.

UNIT – II (09 Lectures)

Pathogenic Germs and Diseases: Health and healthy life; prevalence of utensil and food grains; kshudrarog in humans- PanduRoga (jaundice), Galaganda/Gandmala (mumps) and Masurika (smallpox); prophylaxis- changes in eating habit, clothing habit and bathing; destruction of germs- destruction of germs and their progenies, destruction of germs in active (sakriya) and dormant (susupta) phases, destruction by sun rays, viricidal property in sun rays, eradication of microbes by sun rays.

UNIT – III (08 Lectures)

Vedic Technology: Occurrence of diseases- Yakshma on different parts of body, Kushth, etc.; eradication of Krimis by using medicinal herbs- Apāmārga (*Achyranthusaspera*), Ajashringi (*Pergulariadaemia*), Vach (*Acoruscalamus*) and Prishniparni (*Urariapicta*); eradication of Yakshma by Guggual (*Commiphorawightii*) and by Vach (*Acoruscalamus*); eradication of leprosy by Kushtha (*Costusspeciosus*) and by Pṛśniparṇi (*Urariapicta*); Agnihotra (Hawan, Homa)- material used in daily Yajña, effect of Agnihotra on environment, plants and human health.

UNIT – IV (10 Lectures)

Emergence of Modern Microbiology: Spontaneous Vs Biogenesis, Golden era of microbiology, contributions of scientist and Researchers during Golden age of Microbiology, Carl Woese classification,Whittaker five Kingdom classification, Eight Kingdom classification, ribosomal RNA in microbial taxonomy, concept of microbial species; *Bergey's Manual of Determinative Bacteriology*; microscopy- light, dark field, phase-contrast, fluorescence, and electron microscope; staining techniques- flagella, endospore, capsule, Gram staining, Acid fast staining, Negative staining, VAM staining.

UNIT – V (16 Lectures)

Prokaryotic and Eukaryotic cells- structure and function: Difference between Procaryotic cell and Eucaryotic cell, Morphological types– cell size, shape and arrangements; cell walls- Gram-positive bacteria, Gram-negative bacteria- capsules, fimbriae, pili and flagella; plasma membrane, , ribosomes, inclusion bodies, nucleoid; endospores;Bacterial Growth and its mathematical expression, Nutritional types of bacteria, physical and chemical method of sterilization; Media and its type;Archaeal cell wall; Mycoplasma, non proteobacteria- firmicutes; actinobacteria- cell structure, characteristics features; economic importance in agriculture and industry; cyanobacteria- occurrence, heterocyst, economic importance.

(17 Lectures)

Suggested Reading

1. Dubey R.C. 2021,*Vedic Microbiology- A Scientific Approach*, Motilal Banarasidas International, Delhi 110007.
2. Dubey R.C. and Maheshwari, D.K. *A Textbook of Microbiology*. 3rd ed., S. Chand & Co, Ram Nagar, New Delhi, p. 1034. Cappachino. Microbiology- A laboratory Manual, Pearson Education India ISBN: 978-9332535190
3. Powar and Daginawala. General Microbiology Vol1 and Vol2, Himalaya Publishing House,**ISBN-13:** 978-9350240892
4. Dubey, R.C. and Maheshwari, D.K. *Practical Microbiology*. 2nd ed., S. Chand & Co. P Ltd, New Delhi, p. 413. ISBN: 81:219-2559-2

17-4-21