

Lecture 7& 8**Genus Streptococcus****General characters:-**

They are gram positive cocci arranged in chains, non motile and non sporing. They required media enriched with blood, serum or ascetic fluid for their growth. They are important human pathogens causing pyogenic infection with characteristic tendency to spread. They are also responsible for acute rheumatic fever.

Classification of streptococcus:-

Several system of classification have been employed:

I. Morphological classification :-

Attempt to classify streptococci into long chain (pathogen strain) and short chain (non pathogenic).

II. Classification based on cultural character: -

Streptococci are divided into obligate anaerobic and aerobic or facultative anaerobic. The aerobic or facultative streptococci are father classified on the base of hemolytic property in blood ager plate.

III. Classification based on antigenic structure :-

The aerobic streptococci producing beta hemolytic are divisible into lance field group A,B,C,D,E,F,G,H,K,L,M,N,O,P,Q,R,S,T,U,V on the basis of specificity of polysaccharide chapten antigen present in cell wall. Great majority of hemolytic streptococci that produce human infection belong to grope A.

(a.) Alpha haemolytic

Streptococci produce a zone of greenish discoloration around the colony. This alone of partial lysis is 1-2 mm wide with irregular margin.

(B) beta heamolytic

Streptococci produce sharply defined, clear colorless zone of hemolysis of 2-4 mm wide.

Group A***Streptococcus pyogenic***

Haemolytic streptococci possess a group of specific polysaccharide C and three types specific protein antigen M.T.R

Poly saccharide C antigen :-

This antigen is integral part of cell wall and so it has to be extracted for grouping by precipitation with specific antigen.

M. antigen :- M. protein besides determining type specificity also act as virulence factor by inhibiting phagocytosis.

T. antigen :- it is acid labile and trypsin resistant. It is demonstrated by agglutination with specific antisera.

R. antigen :- streptopyogen and in some strain of group B and C,R protein is found, they have no relation to virulence.

Toxin production1) **Haemolysins**a) **Streptolysin**2) **Erythrogenic toxin**3) **Streptokinase (fibrinolysin)**4) **Deoxyribonucleases :-** they causes depolymerization of DNA5) **Hyaluronidase :-**6) **Protease :-**

Pathogenicity:-

Strepto pyogens is more invasive and produce septicemia readily there is a tendency to spread locally alone lymphatic and through blood stream.

- 1) **Respiratory infection :-**
- 2) **Skin infection:-**
- 3) **Genital tract :-**
- 4) **Other infection :-** (brain, lung, liver, kidney) it may cause, septicemia and pyaemia.

Group B

Streptococcus agalactiae is responsible for mastitis in cow it may be present in human throat and vagina as commensal. They are not resistant to bacitracin.

Group C

Streptococcus equisimilis. They are isolated from horses and cows.

Group D

Enterococci (*streptococcus faecalis*) it is found as commensal in intestine of man.

Pathogenicity

They invade tissue and may produce pyogenic lesion e.g *systitis pyelitis*, vaginitis, cervicitis, puerperal sepsis and subacute bacterial endocarditis.