***3- Faecal streptococci ( enterococci )***

Enterococci are common commensal bacteria in the gut of warm-blooded animals and humans . Enterococci were previously grouped in the “faecal streptococci”, but are now mostly in the genus Enterococcus. which are considered indicators of faecal pollution for water (New fecal contamination).

\*Characteristics of faecal streptococci :

1. Gram positive.
2. Shape: coccus (plural cocci). Arrangement: appear in pairs or chains.
3. Many are facultative anaerobes (capable of growth both aerobically and anaerobically).
4. They are more persistent than *E. coli* and coliform bacteria.
5. Non spore-forming bacteria .

\*There are many Species of these bacteria, including:

1. *Streptococcus faecalis var. liquefaciens.* ( proliferation in plants)
2. *Streptococcus faecium .*
3. *Streptococcus equinus.* ( Bacterial flora in the gut tract of horse)
4. *Streptococcus bovis .*( Bacterial flora in the gut tract of cattle and sheep)
5. *Streptococcus feacalis var. zymogenes .*
6. *Streptococcus faecium var. durans.*

**FC/FS ratio :**

Two indicator bacteria in fecal wastes ( fecal coliforms (FC) and fecal streptococci (FS) - In human wastes, the fecal coliform/fecal streptococci ratio (FC/FS ratio) was greater than 4. In domesticated animals, like cattle, the ratio was between 0.1 and 4. In wild animals, the ratio was less than 0.1.

* The examination of Streptococci is important for chlorinated water because these bacteria resistant to chlorine than coliform.
* *Streptococcus feacalis* & *Streptococcus faecium* associatedwith human waste , The bacteria *Streptococcus bovis* & *Streptococcus equines* associated with animals waste .

Detection methods : MPN , Membrane filter technique, plate count.

Azide Dextrose culture medium : is a selective medium for the detection of enterococci in water and sewage, 1) sodium azide (NaN3) which is inhibitory to coliforms & prevent growth of Gram negative bacteria . 2)Azide- dextrose broth contains Nacl 7.5% that Inhibits growth of non- enterococci.

We use the MPN method that include :

A - Presumptive test :

1. Different water sources such as: river water, sea, Sewage water swimming pool , taken 100 ml.
2. Prepare three groups of test tubes (each set of five test tubes), put in the first row 5 ml of double concentration of Azide dextrose broth. In second row 9 ml and the third 9.9 ml of Azide dextrose broth normal concentration , then sterilize all rows of tubes .
3. The sample inoculates as follows:

R1 = 5 ml of water sample to 5 ml of liquid media (double strength medium).

R2 = 1ml of water sample to 9 ml of liquid media (single strength medium).

R3 = 0.1 ml of water sample to 9.9 ml of liquid media (single strength medium).

1. The tubes are shaken .
2. Placed the rack in an incubator for 37C for 24- 48 hr.
3. Positive results are indicated by turbidity or change the color red or purple to yellow when it is detected by chemical reagent ( phenol red or bromocresol purple) .
4. Refer to the McCrady tables for MPN / 100 ml .

Interpretation of the results :

turbidity or yellow color this means fermentation of sugar and acid production.

B- Confirmed test :

1. From a positive result tube in (Presumptive test ) transfer by a loop to anther tube contain ethyl violate broth, then incubate at 37C for 24 hr.
2. After incubation time observe the purple ring ( positive result ) at the bottom of the tube or forming of extreme turbidity.
3. Make slide & staining to see the bacteria (?).