



Family: Bacillaceae
Genus : *Clostridium*

- a) *C. tetani* (tetanus)
- b) *C. perfringens* (gas gangrene)
- c) *C. botulinum* (food poisoning)
- d) *C. difficile* (sever diarrhea)

All spp. Are human pathogens and cause sever infection.

General characteristics:

- G +ve anaerobic.
- large bacilli.
- saprophytes in the external environment (soil)
- they produce exotoxin & enzyme
- vegetative forms are slightly motile
- spore former. spore can resist oxygen except *C. tetani* which strict anaerobes, opt.temp. 37 C°.
- Spores are wider than bacillary body, giving bacillus a swollen
- few of them are capsulated,
- colony morphology is variable
- They lack catalase peroxidase as other anaerobic bacteria.

Specimen's collection:

Samples must be carefully collected and transport in gassed out (evacuated) tube, inoculated on appropriated media, incubated anaerobically (gas pack and jars)



candle jar



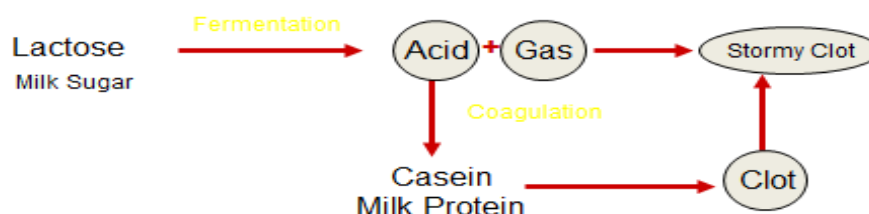
An aerobic jar

Pathogenicity and Diseases:

- 1- *C. botulinum* : Result from ingestion of food contaminated by performed botulinum toxin, rather than from multiplication of *C. botulinum* in the gastrointestinal tract, it resemble *staphylococcal* food poisoning, the sample is stool.
- 2- *C. perfringens* : Form gas gangrene (lethal infection), the hemolysis of blood is by producing an exotoxin called α - toxin cause stormy fermentation of milk

Reaction on Litmus Milk

Stormy Clot Formation



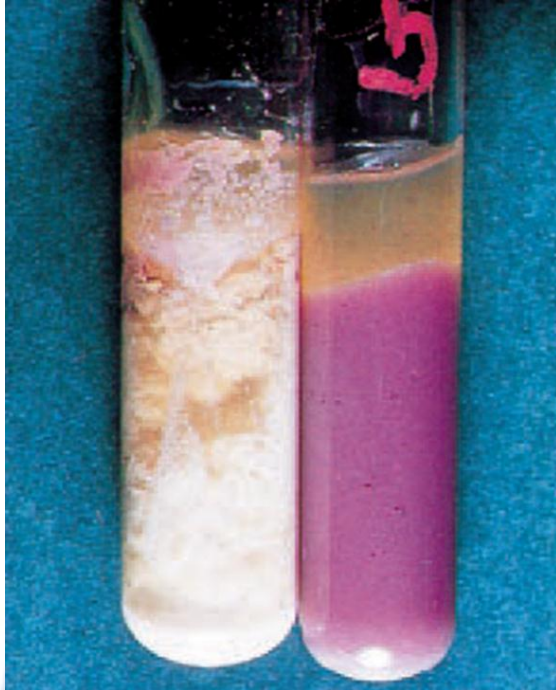


figure:

Stormy Fermentation of Litmus Milk.

The tube on the left shows fermentation; the tube on the right is negative for stormy fermentation

- 3- *C. tetani* : strict anaerobes, capsulated from terminal spore appear as (tennis rackets) cause tetanus which is a fatal disease caused by toxin (tetanospasmin).



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4- *C. difficile* : Cause diarrhea in children (sever summer diarrhea)

Drug of choice:

Vancomycin , Penicillin G.

Alternative drug: Bcitracin , Chloramphenicol , Clindamycin