Corynebacterium spp.

- Species
- Morphology and Staining
- Cultural Characteristics
- Diseases
- Biochemical Tests

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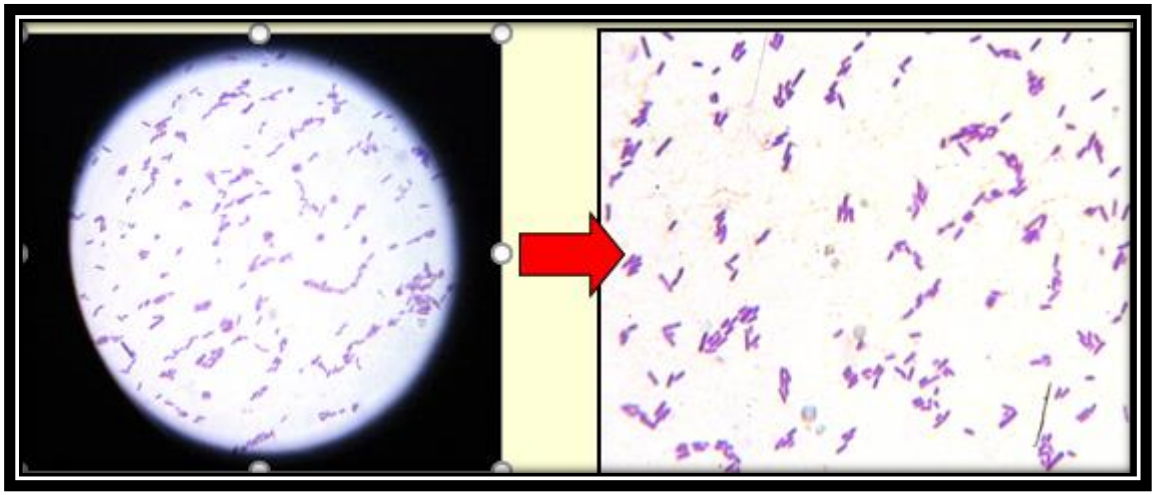
Species

Corynebacterium diphtheriae

C. ulcerans

Morphology and Staining

Corynebacterium species are Gram-positive, non-motile rods often with clubbed ends, occurring singly or in pairs. Non spore-forming.



- Their size is 2 – 6 µm in length and 0.5 µm in diameter.
- They are arranged together in a characteristic way, which has been described as ‘V’ or ‘L’ shaped ‘palisades’.
- Metachromatic granules are usually present representing stored phosphate regions.
- Some cells may stain unevenly giving a beaded appearance

Cultural Characteristics

- The species are aerobic or facultative anaerobic and exhibit a fermentative metabolism (carbohydrates to lactic acid) under certain conditions.

- They are fastidious organisms, growing slowly even on enriched medium (agar containing blood and potassium tellurite).

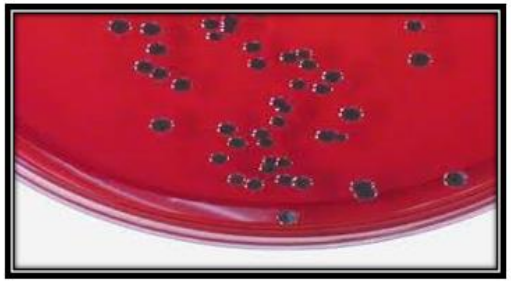
Cultural Characteristics

- Agar containing blood and potassium tellurite serves as a semi-selective and differential medium.

- On blood agar, they form small greyish colonies with a granular appearance, mostly translucent, but with opaque centers, convex, with continuous borders. Their optimum growth temperature is 37°C.







Skin swabs on blood agar incubated in (5 to 10% CO_2) at 35 -37 °C for 40 - 48 hours .

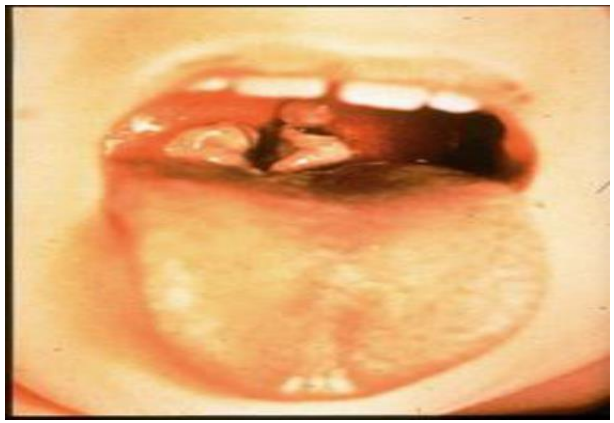
Throat swabs incubated anaerobically at 35 - 37°C for 16 to 24 hours. β-haemolytic.

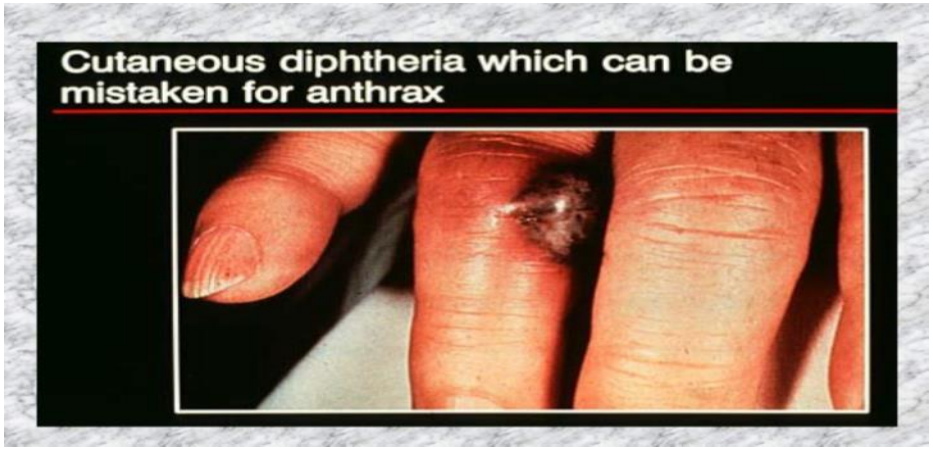
Corynebacterium diphtheriae

Clinical findings:

Respiratory diphtheria Thick, gray, adherent pseudomembrane over the tonsils and throat

Cutaneous diphtheria ulcerating skin lesion covered by a gray membrane .





Laboratory diagnosis:

Specimens: throat swab or swab from pseudomembrane

Microscopy-

- Staining by Gram or methylene blue (G +ve rods arranged as L or V shaped)
- Albert stain (differential stain) for metachromatic granules

Culture-

Loeffler`s medium (creamy white colonies in 6-8 hrs)

Advantages of Loeffler`s medium

1 -growth is very fast

2-metachromatic granules are seen better



Potassium tellurite medium (McLeod`s medium)

Black colonies Because this agar contain tellurite that is reduced to elemental tellurium within the organism

Advantages of McLeod`s medium

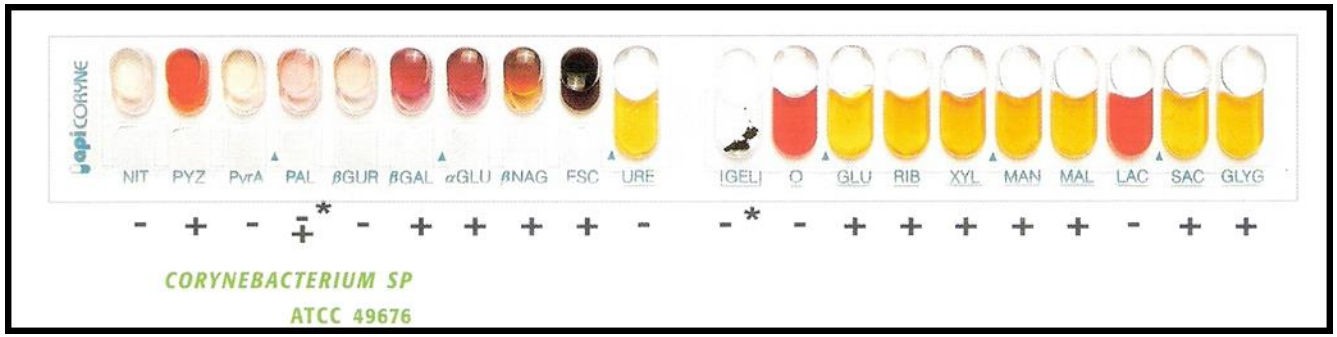
1-It is a selective medium and gives a discrete colonies of *C. diphtheriae*

2-It can be used to isolate *C. diphtheriae* from carriers even the small number of bacteria are present.



143 ***Corynebacterium diphtheriae*, tellurite blood medium.** *Corynebacterium diphtheriae* reduces tellurite and produces gray-black colonies. Commensal diphtheroids are gray. (Tellurite blood agar, 48 h at 37°C)

Biochemical tests and API for diagnosis of *Corynebacterium* spp.



Listeria spp

- Species
- Morphology and Staining
- Cultural Characteristics
- Diseases
- Biochemical test

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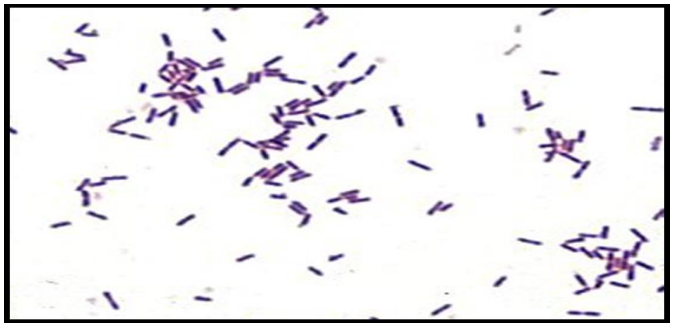
Species

- *Listeria monocytogenes*
- *Listeria ivanovii*

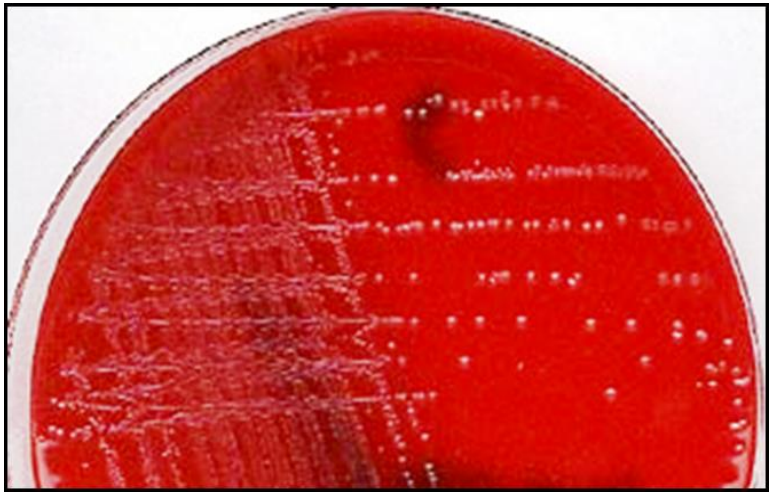
Morphology and Staining

Gram positive , non spore forming , small rods , arrangement as single, pair , or v-shaped. In new culture appear like the arrangement of Corynebacterium (palisades) , motile in liquid media which contain glucose in 6-25 c for 6-18hr.(tumbling movement).



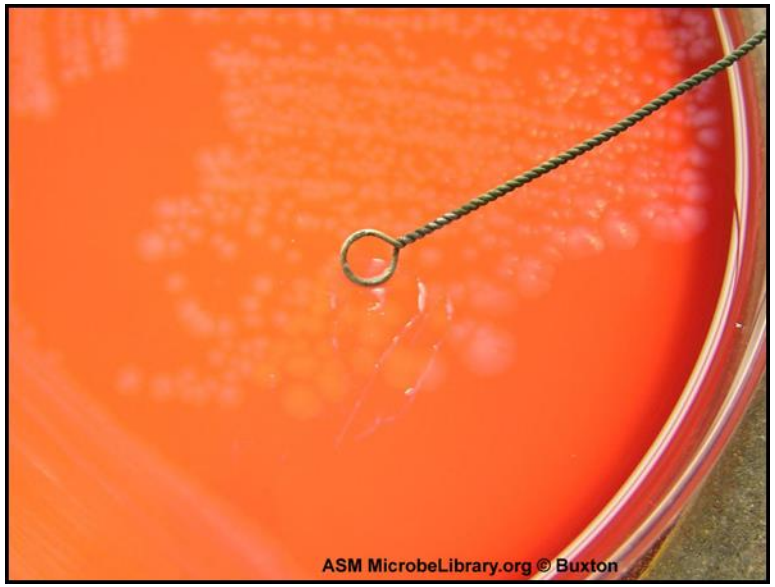
Cultural Characteristics

- Isolation can be enhanced if the specimen is kept at 4 º C for some days before inoculation into media.
- The bacteria grow aerobically but some species need Co2. The growth increased with addition of serum , blood , glucose or liver extract .



Cultural Characteristics

- The hemolysis is little but β-hemolysis in blood agar of sheep.



Disease

- Pathogenic infection by *L. monocytogenes* results in listeriosis and usually affects individuals pre-disposed through an underlying disease affecting the immune system, such as cancer or AIDS, and also other susceptible individuals such as the elderly, pregnant women, newborn babies or fetuses.

- Symptoms of the disease are flu-like, yet may result in severe complications, such as meningitis, septicaemia, spontaneous abortion or listeriosis of the newborn



CAMP test between *Listeria monocytogenes* & *S. aureus*

Note: the motility at room temp. and the hemolysin production are primary findings that help in differentiation of Listeria from **Corynebacterium**


Thanks