

Staphylococcus & streptococcus

Main topics we will talk about in this lab:

-two major types of staph. & differences between them

-streptococcus groups (alpha,beta,gama)

-major cultures media

Staphylococcus groups

"catalase +ve"

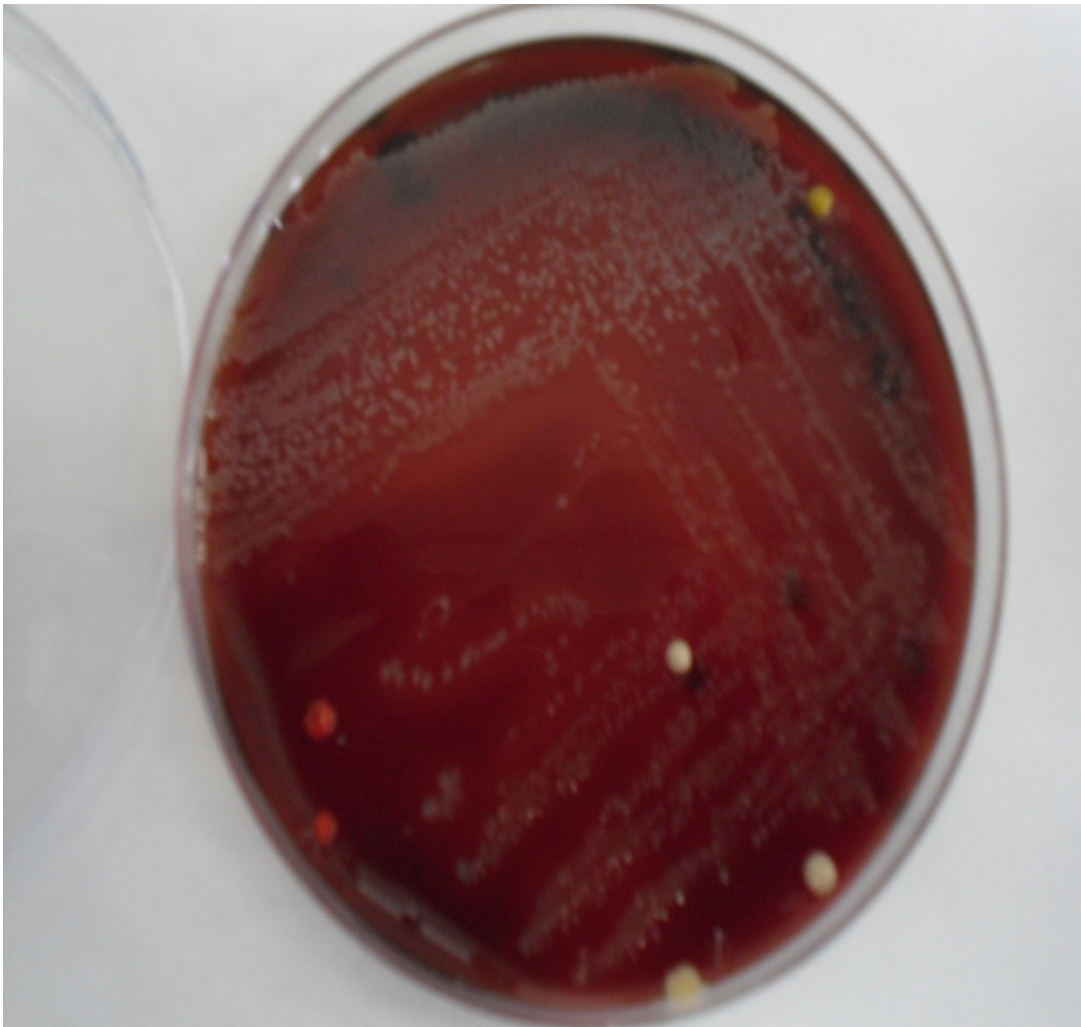
Two major types of staphylococcus are used in lab procedures due to their significance in culture media; staph. aures (mostly pathogenic) & staph. albus (opportunistic) which are

Incubated mainly on two types of culture media:

- **blood agar** (general purpose medium) → is a media that provides enough nutrients in which most any microorganism will utilize for growth. Allows for a wide variety of microorganisms "gram +ve, gram -ve, yeasts" to grow. whether they are normal or pathogenic bacteria.

- **CLED media** (Cysteine Lactose Electrolyte Deficient agar), originally it has a green color

& its selective in this case to identify between staph. albus & staph. aures



***Staphylococcus
in blood agar
appear as a large
white colonies***

Throat swab culture:

Throat swab is cultured on blood agar media & after 24 hours of incubation on 37 degree, mixed culture is formed as a mixture between microorganisms.

Staph. appear as a large white colony on blood agar so we take & culture it on cled media. This is Called” **sub culture**”

If the cled color turned into golden yellow then it's a staph.aeurus & is coagulase +ve,while in albas it stays the same.however,staph.albas sometimes appear as aeurus on cled that's why its placed by more specific media which is the “ **manitol salt agar**”

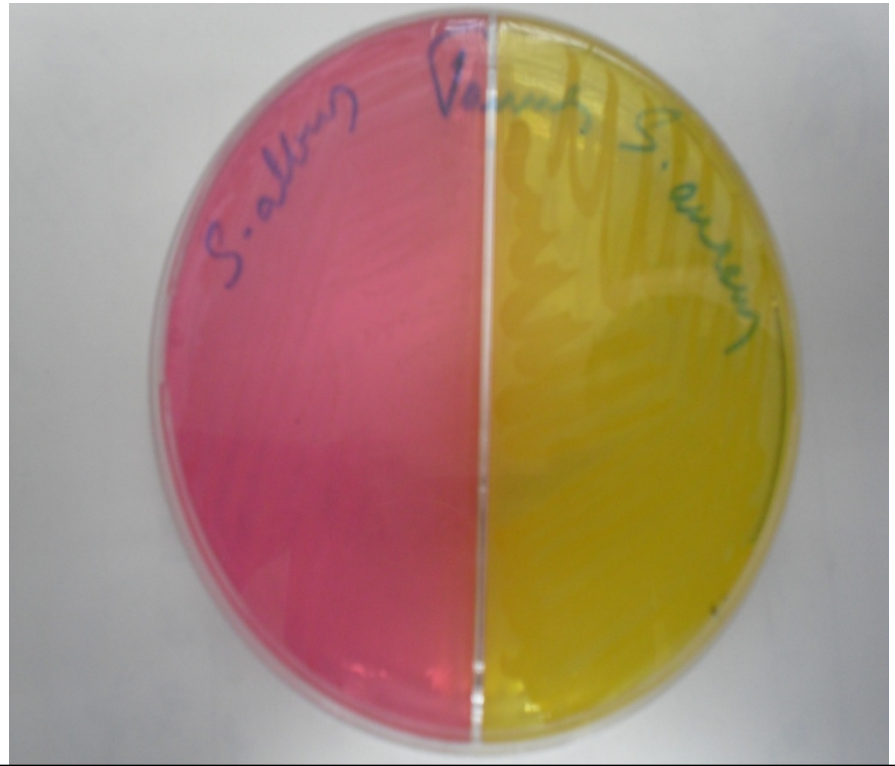
That is pink in color so when it turned into;

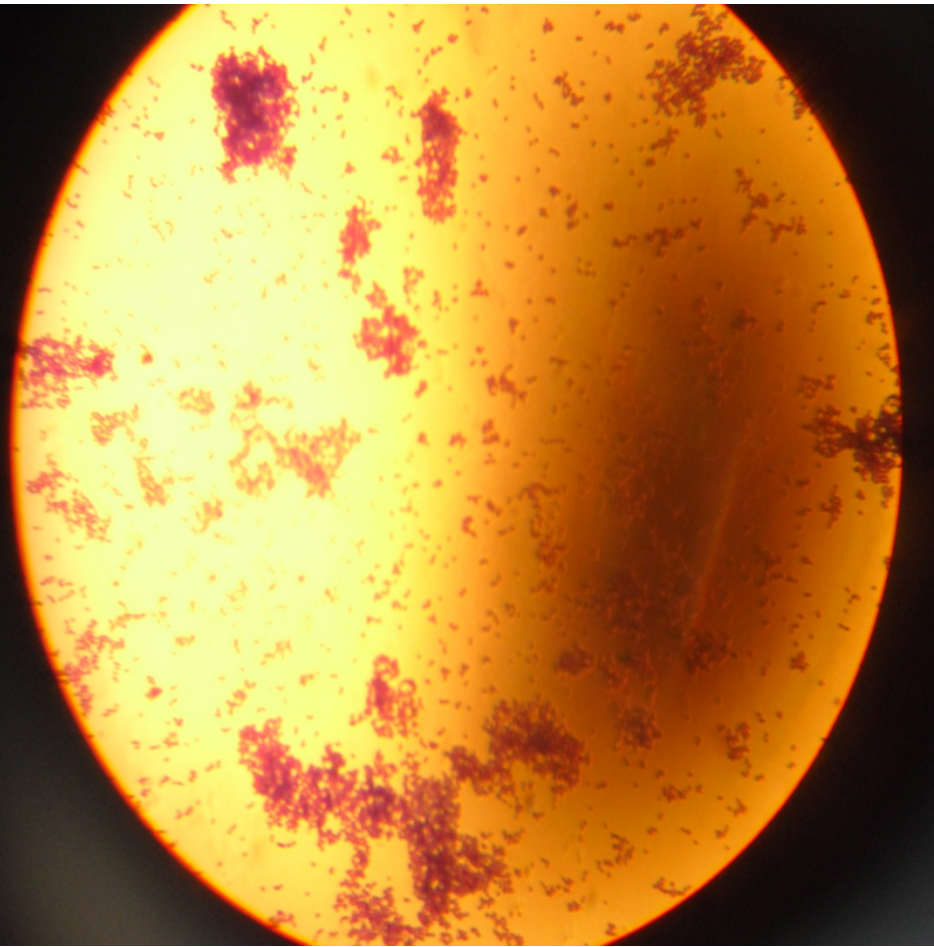
- golden yellow: then it's a staph.aeurus(similar to cled)
- stays pink with white cells then it's a staph.albas



**Staph.aureus in cled agar
appears golden yellow
← If its coagulase +ve. they are
pathogenic bacteria**

**Manitol salt agar:
Staph.aureus → yellow golden ←
Staph.albas → pink**





***Staph. Under microscope
appear as gram +ve clusters***

***Note:
Under
microscope we
cant distinguish
between
staphylococcus
groups; auerus &
albas***

To differentiate between staph. And strep.:

-In blood agar:

Staph.: larger colonies.

Strep.: pinpoint colonies.

- Catalase test:

Staph.: +ve reaction which means that it can convert H_2O_2 into H_2O and O_2 by catalase enzyme. where air bubbles are formed.

Strep.: -ve reaction.

“Streptococcus groups”

***Based on cell wall hemolytic activity on blood agar,
are divided into:***

***α -Streptococcus:* destroy RBC partially on blood agar**

***β -Streptococcus:* all beta strains produce hemolysin enzyme which result in complete digestion of RBC on blood agar. Examples include *Streptococcus haemolyticus*.**

***GAMMA- Streptococcus:* no effect on blood agar**

β -Streptococcus:

The most significant groups are: A & B

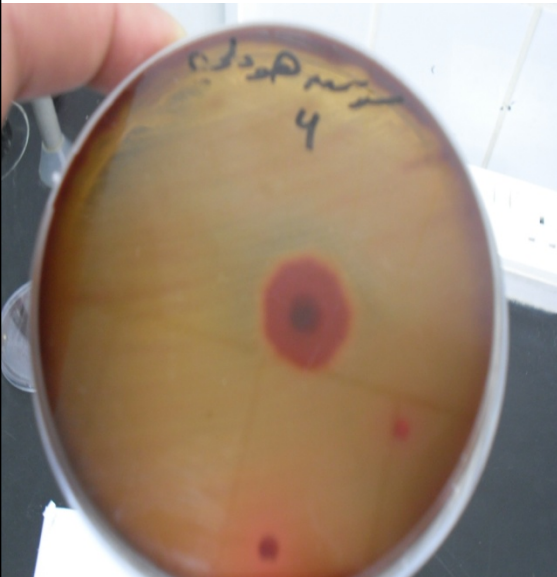
**A: is the only strain that is susceptible to Bacitracin(BA)
antibiotic disk**

Where inhibition zone is formed around.

E.X: strep.pyogens

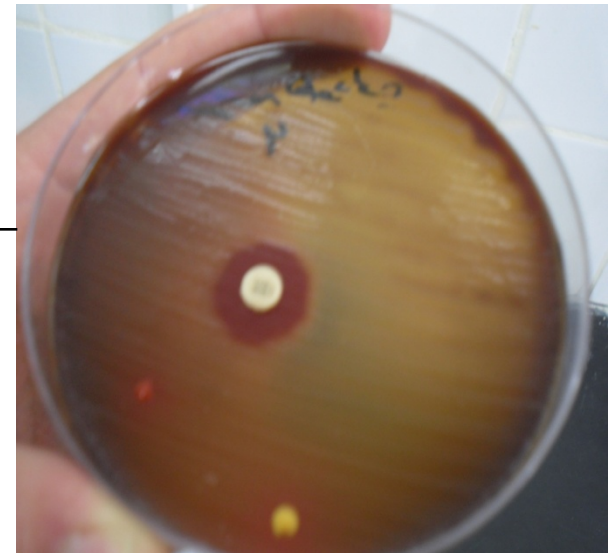
**B: its resistant to bacitracin antibiotic disk so has no
inhibition zone**

E.X: strep.agalactiae

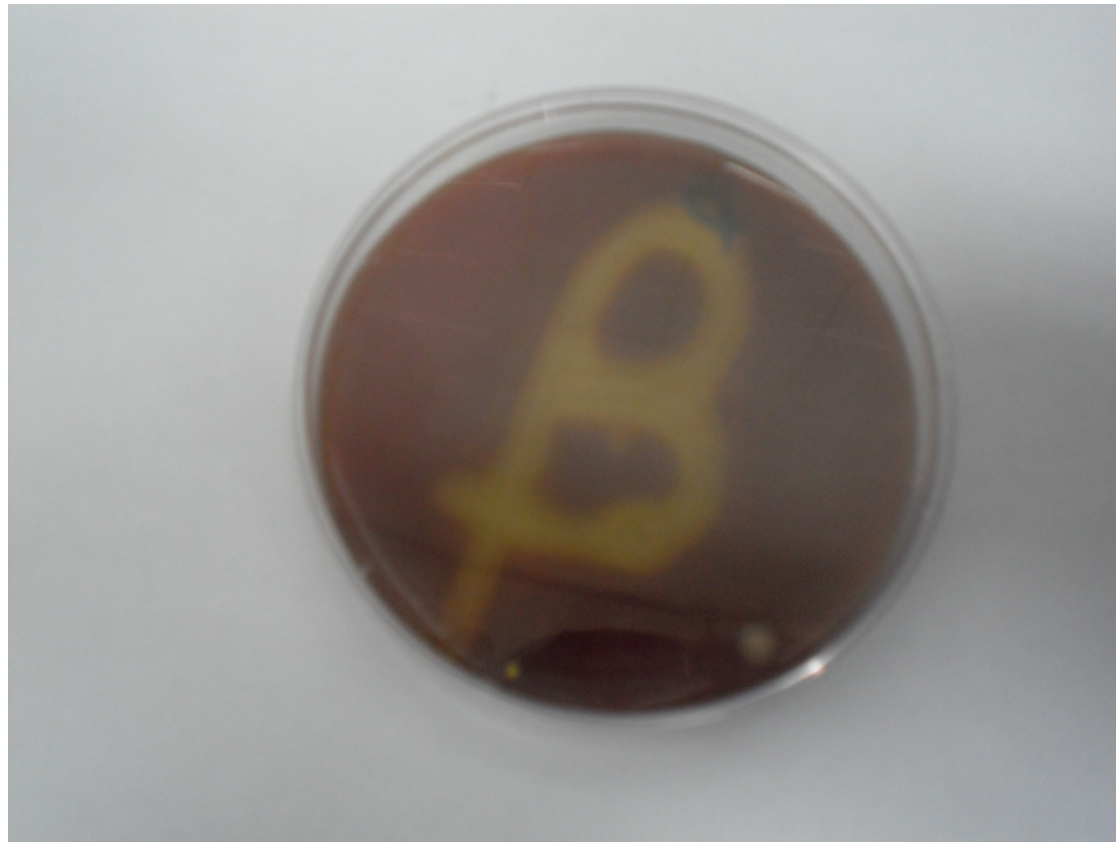


→ **group B**

**Group
A**



Here we can't say whether its group A or B because there is no antibiotic disk so we just say its ***β-hemolytic strep.***



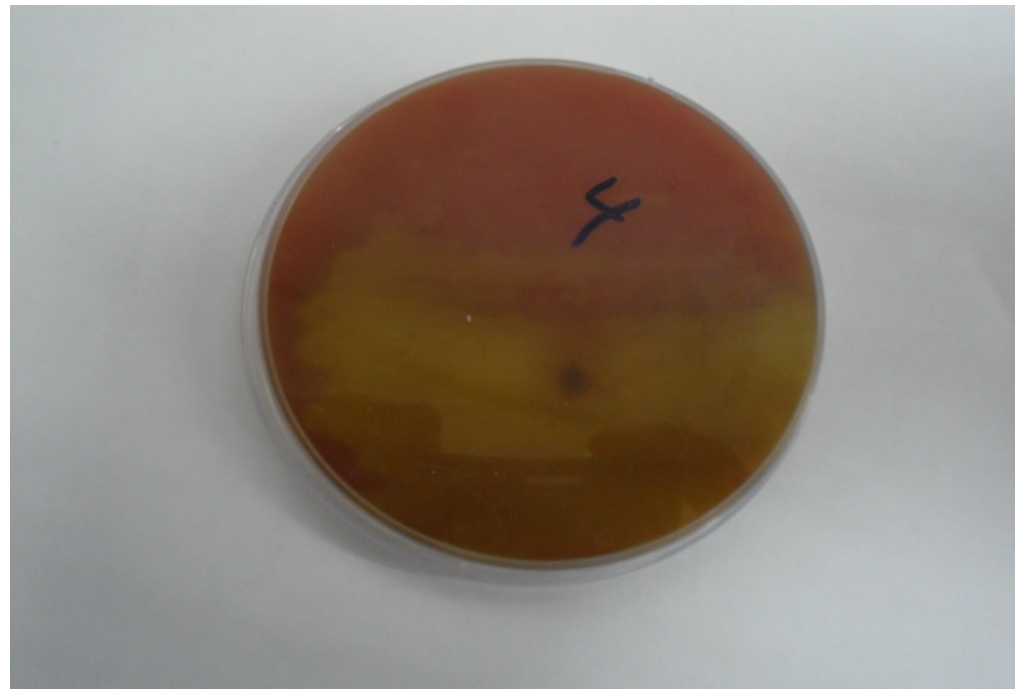
α - hemolytic streptococci :

It lyses blood partially in vitro, the place of bacterial growth is grayish green.

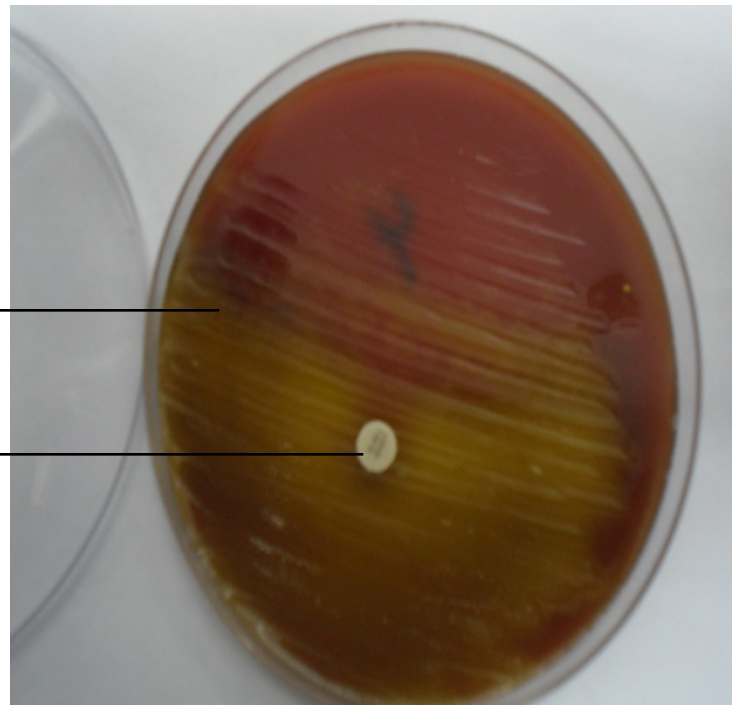
A subtype of α -hemolytic strep. Is **streptococcus viridans which is part of normal flora*

A dangerous & pathogenic subtype is **strep.pneumoina which appears in gram stain as gram +ve, diplococci(pairs), lancet shape (like num 8 or glasses shape) & its not completely round*

***α - hemolytic
streptococci***



Strep. pneumoniae is susceptible to an "optician disk"
Which is 18 mm in diameter and is highly specific
For bacteria, when do purification((pure colony)) & apply
a new
Bacteria to the disk & the zone was larger than 18mm
Then it's a *streptococcus pneumoniae*((the greenish zone))



Strep.
pneumonia

Optician
disk

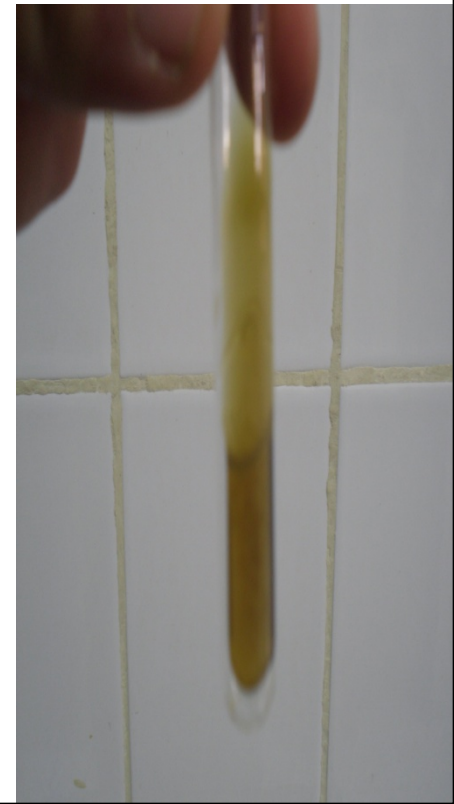
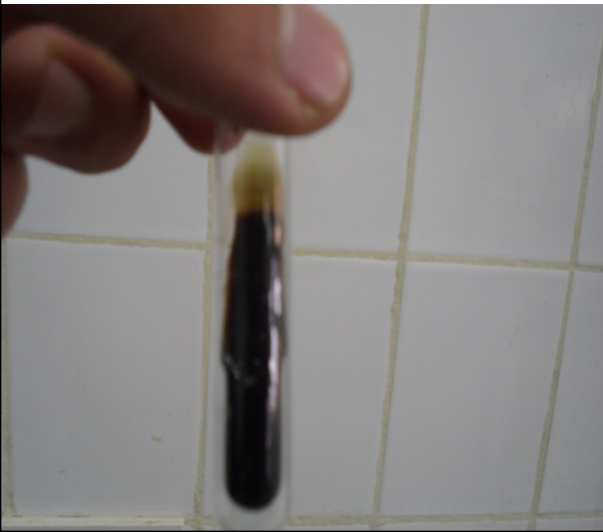
Non hemolytic streptococcus

Enterococcus is an example specially ((enterococcus faecalis)). We do bile esculin test for it cz it has no effect on blood agar. appears in gram stain

As gram +ve short chains((each consist from 4 or 5 cells)),While β -streptococcus shows long chains((like the necklace)) .

GAMA hemolytic strep.

We use **bile esculin** test which is green in color, after incubation; in the second day it turned into black which is called now "**esculetin**" due to the presence of Iron & to the gamma strep





These pics are from the net 😊

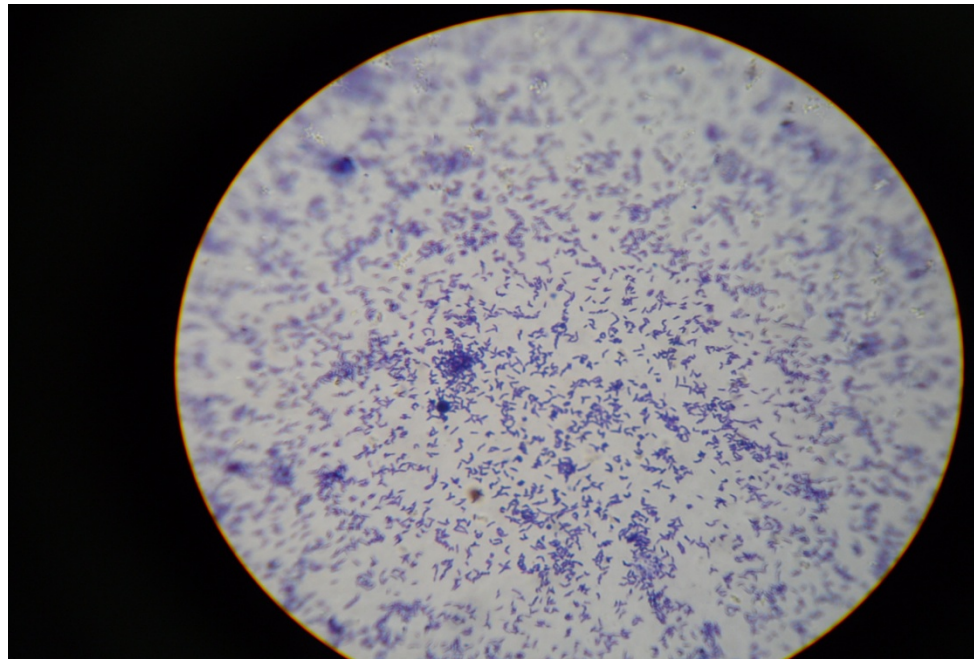
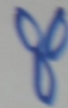


<p><i>Enterococcus faecalis</i> & group D strep. hydrolyzes esculin in the presence of bile and turns more than half the medium dark brown. This is a positive result.</p>	<p><i>Streptococcus pyogenes</i> does not hydrolyze esculin in the presence of bile. No dark brown complex is formed. This is a negative result.</p>

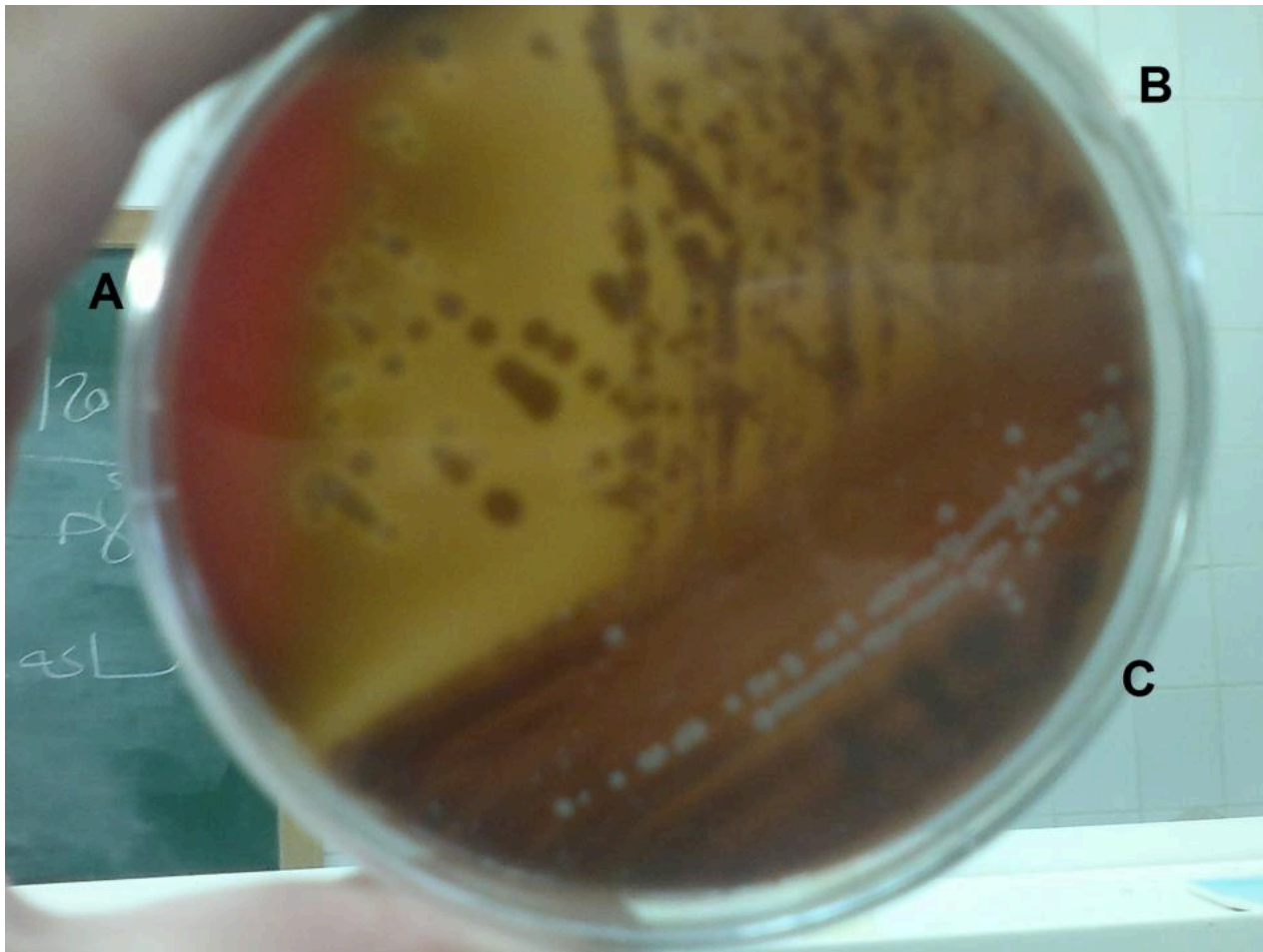
Diphtheroids

Gram-positive Chinese

Letters (Rods)



A-diph B-staph C-strep



DONE BY:

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*As they say life isn't about finding ourselves but
its about creating ourselves.*

Dedicated to all who supported me ;))