LAB: 6 Practical Pathogenic bacteria

Enterobacteriaceae is a large family of Gram-negative bacteria includes over 30 genera and more than 120 species.

Some Genera

Citrobacter, Enterobacter, Escherichia, Hafnia, Morganella, Providencia, Klebsiella, Proteus, Salmonella, Shigella and Serratia.

Lactose fermenting:

Genus: Escherichia

Genus: Klebsiella

Genus: Enterobacter

Escherichia coli

Figure : *Escherichia coli* on MacConkey agar (Dry pink colonies)

Figure : *Escherichia coli* on EMB agar (Dark colony and Green metallic sheen).

characteristics

1- Gram negative

2- Coccobacilli

3- Facultative anaerobes

4- None spore forming

5- Capsule: have microcapsule

6- Motility : 80% motile , 20% none motile

7- Catalase : positive

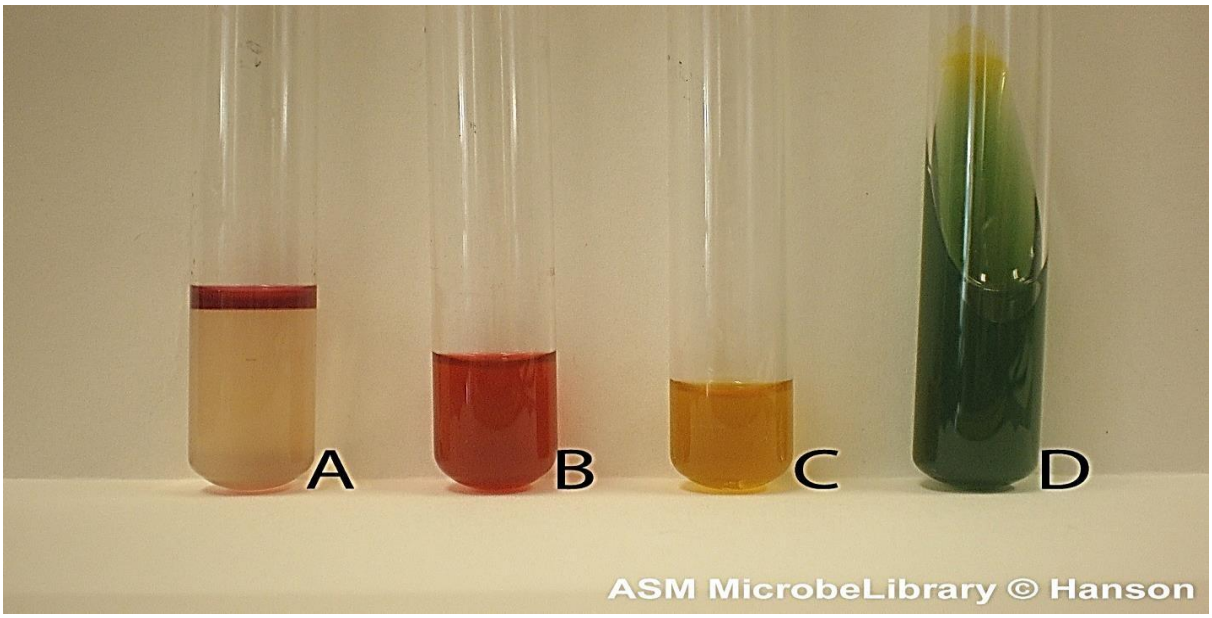
8- Oxidase : negative

9- Urease : negative

10- IMViC test : positive ,positive . negative , negative

11- TSI agar test : Acid \ Acid , Co_2 + , H_2S –

12- Lactose fermenting (Dry pink colonies)



Klebsiella spp

- ***K. pneumoniae*** **(type-species)**
- ***K. granulomatis***
- ***K. oxytoca***
- ***K. michiganensis***
- ***K. quasipneumoniae***
- ***K. grimontii***
- ***K. variicola***

Figure : *Klebsiella* on MacConkey agar (mucoid pink colonies)

Figure : *Klebsiella* on MacConkey agar (mucoid pink colonies)

Figure : *Klebsiella* on EMB agar (mucoid purple colonies)

General characteristics

1- Gram negative

2- Coccobacilli

3- Facultative anaerobes

4- None spore forming

5- Capsule: positive

6- Motility : none motile

7- Catalase : positive

8- Oxidase : negative

9- Urease : positive

10- IMViC test : negative , negative, positive ,positive

11- TSI agar test : Acid \ Acid , Co_2 + , H_2S –

12- Lactose fermenting (mucoid pink colonies)

Enterobacter spp

Enterobacter aerogenes

Enterobacter cloacae

Rough and smooth colony growth of *Enterobacter cloacae* bacteria on Tryptic Soy agar

General characteristics

1- Gram negative

2- Coccobacilli

3- Facultative anaerobes

4- None spore forming

5- Capsule : V(variable)

6- Motility : motile

7- Catalase : positive

8- Oxidase : negative

9- Urease : V (variable)

10- IMViC test : negative , negative, positive ,positive

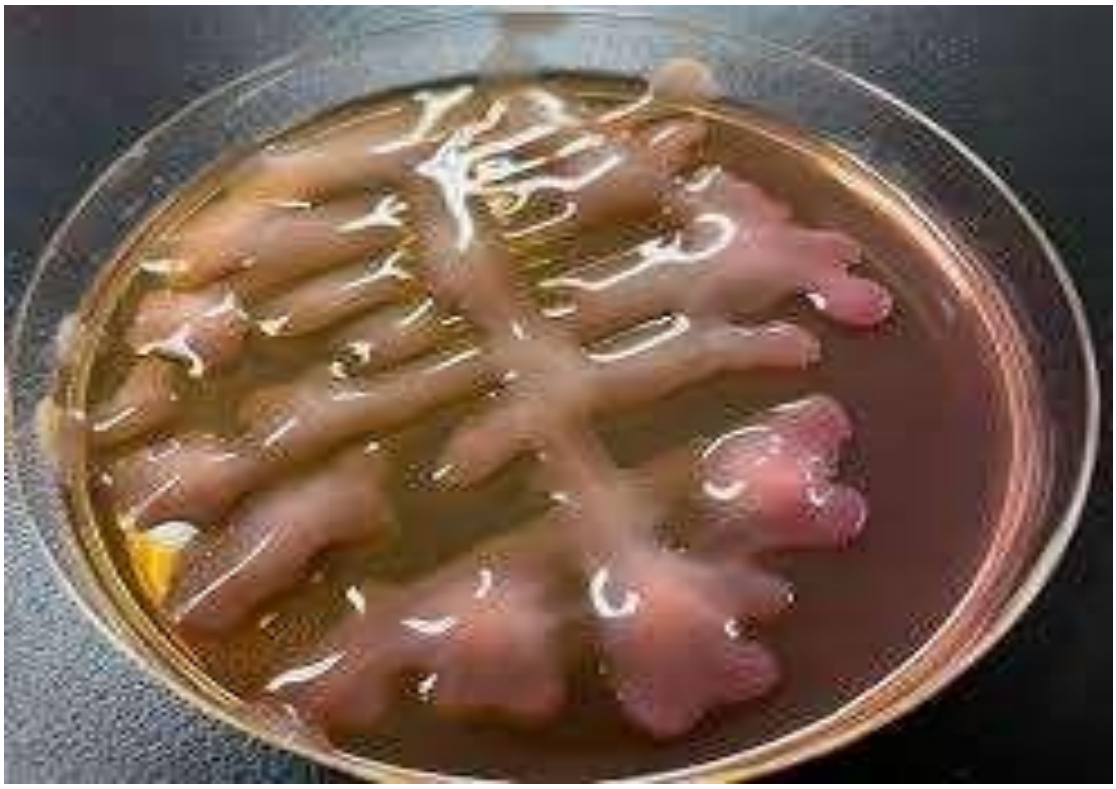
11- TSI agar test : Acid \ Acid , Co_2 + , H_2S –

12- Lactose fermenting (mucoid pink colonies)

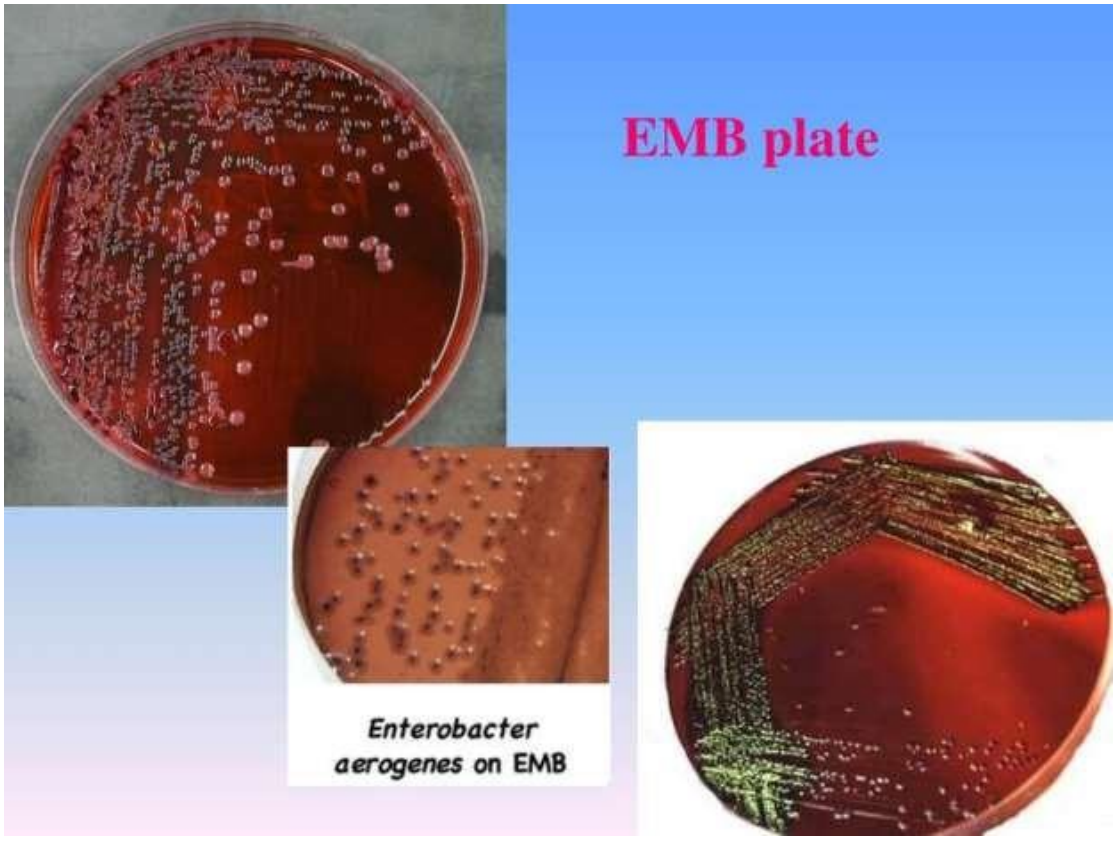
The encapsulated strain of *Enterobacter aerogenes* on MacConkey medium

***Enterobacter aerogenes* on MacConkey medium**

Enterobacter cloacae



Enterobacter aerogenes

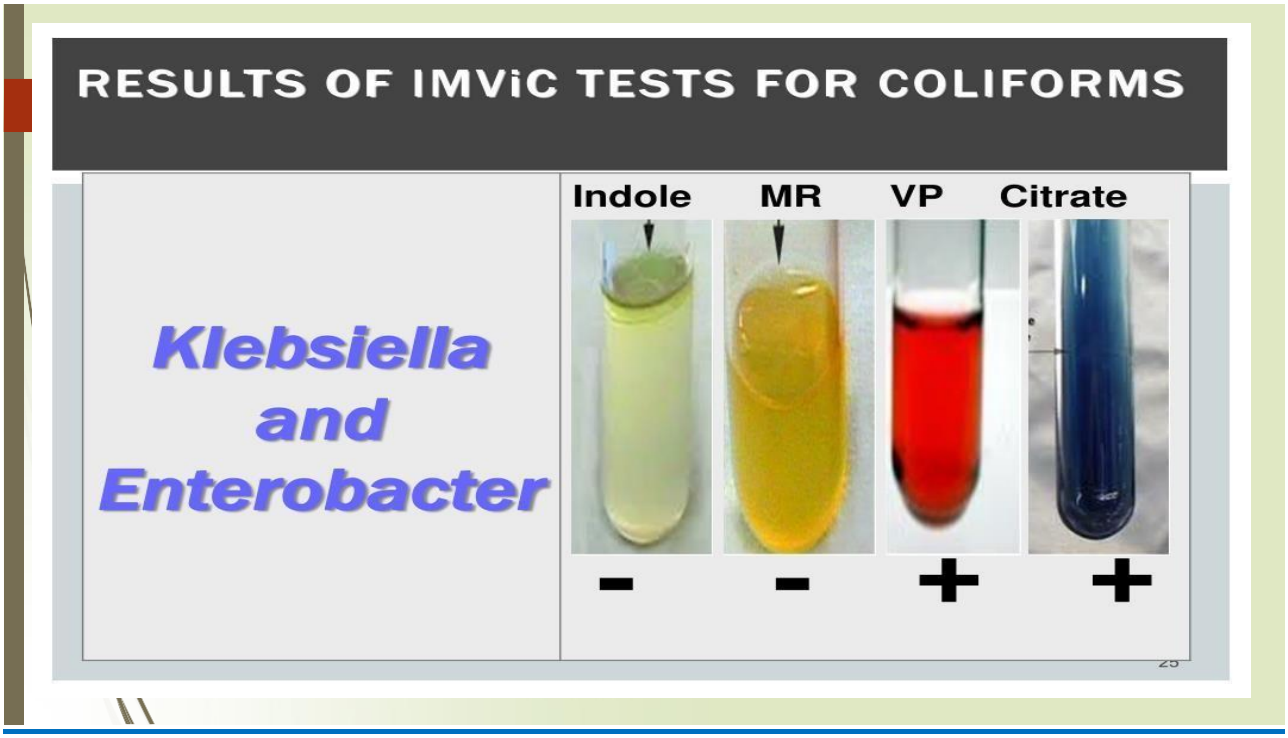


Note :

Eosin Methylene Blue Agar (EMB)

***Selective/Differential**
*** Selective for: Gram (-)**
Components:
Eosin dye/MB dye;
Lactose Results:
Differentiates
between lactose and non-lactose fermenters:
- (Some acid = pink)
- (Large acid = metallic green)
- (No acid = colorless)
(*E. aerogenes* = Pink, *E. coli* = Green (Lactose fermentation), Pseudomonas ssp = Clear.)

Tests	*E.coli*	Klebsiella	Enterobacter
Catalase	+	+	+
Oxidase	-	-	-
Lactose	F	F	V
Urease	-	+	V
IMViC	+,+,-,-	-,-,+,+	-,-,+,+
TSI	A\A CO_2+ ,H_2S -	A\A CO_2+ ,H_2S -	A\A CO_2+ ,H_2S -
Motility	+	-	+
Spore	-	-	-
Capsule	microcapsule	have	V
H_2S	-	-	-
EMB agar	Green metallic sheen	Mucoid pink to Purple	Pink to Purple
MacConkey agar	Pink	Mucoid pink	Pink
Glucose	F	F	F



Lab Diagnostic tests

1-gram stain

2-IMViC test

3-TSI agar test

4-Catalase test

5-Oxidase test

6-Urease test

7-MacConkey agar 8-EMB agar

9-Blood agar ……10-Motility test