Urogenital System

Microbiology Lab

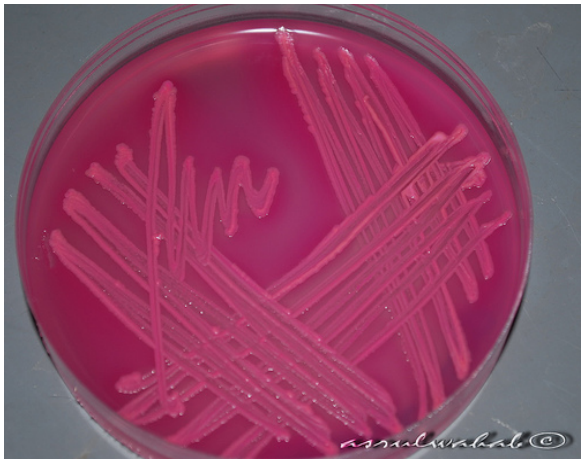
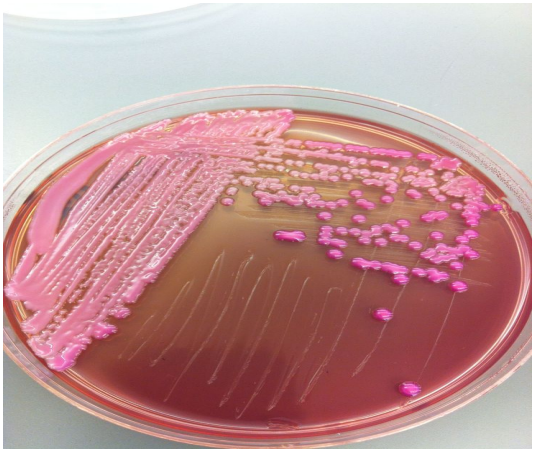
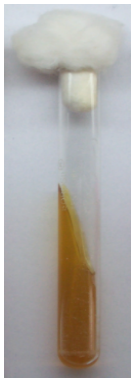
Table 1: Lactose and Glucose Fermental Bacteria

Bacteria	E. Coli	Klebsiella Pneumonia
MacConkey Agar (original color is red/orange. It contains lactose)	Deep pink colored colony (strong fermentation).	Mucoid or wet looking colony, and light pink colony (weak fermentation).
Gram Stain	Gram negative – Short rods.	----------
Other Features	----------	Encapsulated.
Biochemical Tests: You take a colony, inoculate it into the tube, and incubate it for 24 hrs.		
Kligler's Iron Agar (Red tube that contains lactose, glucose, and Phenol Red)	Whole tube will turn yellow: lactose on the surface will be fermented (yellow), and glucose in the bottom will be fermented (yellow). Yellow color is due to production of acids and lowering of pH that turns the phenol red → yellow.	Whole tube will turn yellow: lactose on the surface will be fermented (yellow), and glucose in the bottom will be fermented (yellow). Yellow color is due to production of acids and lowering of pH that turns the phenol red → yellow.
Citrate Test (Original color is green)	Negative Test: remains green.	Positive Test: turns into blue color.
Urease Test (Original color is yellow/orange)	Negative Test: orange.	Negative or Positive Tests (depending on the strain): positive test gives deep pink color.
SIM Culture Media (H_2S, Indole, and Motility) (Colorless Media) (Indole ring is detected by Covax Reagent)	Motility: media becomes turbid. H_2S: negative (no black color). Indole: positive test - gives red ring.	Motility: media doesn't become turbid. H_2S: negative (no black color). Indole: negative test – no red ring.

Note: for further identification of bacteria we use kit identification and serotyping.

Note: focus on the tests that give different results between E. Coli and Klebsiella because that will help you in identification of the bacteria.

First Table: Lactose and Glucose Fermental Bacteria

E. Coli	K. Pneumonia
 **MacConkey Agar**	 **MacConkey Agar**
 **Kligler Iron Agar**	 **Kligler Iron Agar**

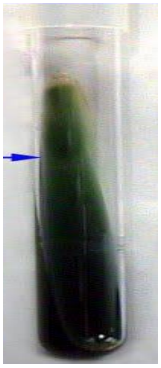
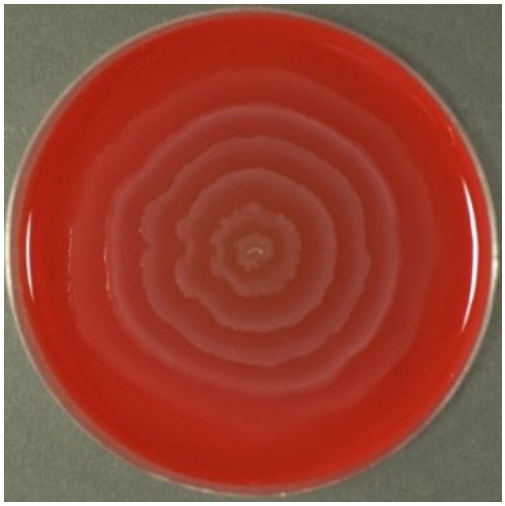
 **Citrate Test**	 **Citrate Test**
 **Urease Test**	 **Urease Test**
 **SIM Culture Media**	 **SIM Culture Media**

Table 2: Glucose Fermental, but Lactose Non-Fermental Bacteria

Bacteria	Proteus	Morganella Morgani
Agar	**Blood Agar (for enrichment):** Swarming phenomena (irregular growth), because it's highly motile. Very bad smell because of H_2S production.	**MacConkey Agar:** no fermentation of lactose (remains orange). It is motile.
Biochemical Tests: You take a colony, inoculate it into the tube, and incubate it for 24 hrs.		
Kligler's Iron Agar (Red tube that contains lactose, glucose, and Phenol Red)	Red on Yellow (after 10-16hrs): lactose on the surface will be not be fermented (red), while glucose in the bottom will be fermented (yellow). Black color due to H_2S production (after 24hrs). Gas production will push the media upwards.	Red on Yellow (after 10-16hrs): lactose on the surface will be not be fermented (red), while glucose in the bottom will be fermented (yellow). No H_2S production.
Citrate Test (Original color is green)	Negative or Positive Tests depending on the strain.	Negative Test: remains green.
Urease Test (Original color is yellow/orange)	Strong Positive Test: deep pink color.	Positive Test: positive test gives pink color.
SIM Culture Media (H_2S, Indole, and Motility) (Colorless Media) (Indole ring is detected by Covax Reagent)	Motility: media becomes turbid. H_2S: positive (black color). Indole: negative test – no red ring.	Motility: media becomes turbid. H_2S: negative (no black color). Indole: positive test – gives red ring.

Note: Most Enteric Bacteria produce Gas.

Table 2: Glucose Fermental, but Lactose Non-Fermental Bacteria

Proteus	Morganella
 **Blood Agar**	 **MacConkey Agar**
 **Kligler Iron Agar**	 **Kligler Iron Agar**

 **SIM Culture Media**	 **SIM Culture Media**

Table 3: Staphylococcus Strains

Bacteria	Staphylococcus aureus	Staphylococcus Albus
Mannitol Salt Agar (original color is deep pink)	Yellow golden colony	White colony
Other Features	Coagulase Positive – More virulent.	Coagulase Negative – Less virulent.

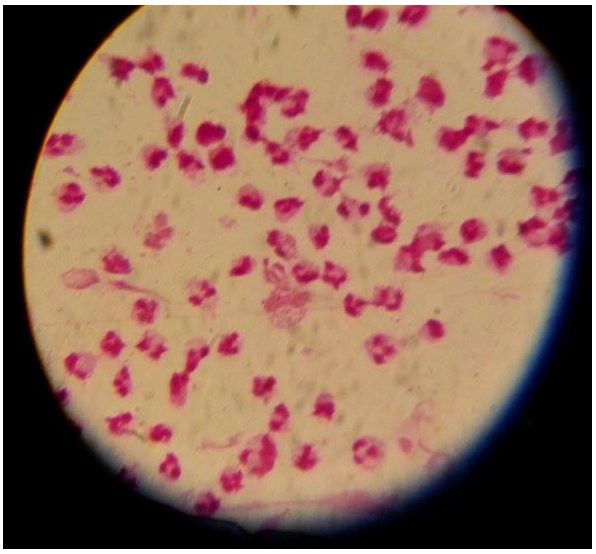
Table 4: Enteric Bacteria

Bacteria	Enterococcus Fecalis
Bile Esculin Agar Tube (original color is green)	Black color. It's in slant form.

Light Microscope Slides:

Bacteria	Enterococcus Fecalis
Neisseria	Direct Smear Slide: gram-negative (red) diplococci. It's very small. You might see indentation between the two cocci. Intracellular Slide: diplococci surrounded by WBCs.

Neisseria Direct Smear



Intracellular Neisseria

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