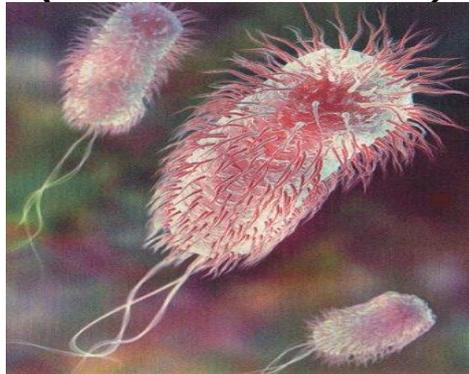


## **GENUS: ESCHERICHIAE**

### **(*Escherichia coli*)**



### **MORPHOLOGY:-**

- 1- Gram negative, non-spore forming rods
- 2- Length is 2-3  $\mu$ , thickness is 0.4-0.6  $\mu$
- 3- Most of strain are motile e` long peritrichous flagella
- 4- Some strain produce capsule
- 5- Producing mucoid elastic colony on CHO containing media.
- 6- Arranged in either singly or pairs.
- 7- Most of spp. formed Pilli or fimbriae
- 8- Fimbriae are type one which make hemagglutination and mannose sensitive.

### **Culture characters:**

- 1- Aerobic & facultative anaerobic grow at 14-44°C but optimum temp. is 37°C

2-Grow on ordinary agar media it grow easily on MacConkey media.

3- Colonies appear after 24 hr. As smooth glossy translucent, rounded, rose pink or red colonies.

4- On blood agar media some strains reduced  $\beta$ -hemolysis or clear zone of  $\beta$ -hemolysis

- on Eosin methylene blue  $\rightarrow$  metallic green sheen colonies.

### **BIOCHEMICAL REACTION:-**

1-Ferment glucose & Lactose producing acid & gases but sucrose , salicin , dulcitol produce variable.

Gelatin is not liquefied. 2-

2- Urease test (-ve)

3-IMViC is very important (Indol.+ve , Methyl red..+ve, VP..-ve, Citrate utilization..-ve)

4- On triple sugar iron agar media (TSI) formation of (acid slant + acid bult + gases but no H<sub>2</sub>S) A/A

### **ANTIGENIC STRUCTURE:-**

1- 3 Kind of surface Ag are identified by agglutination test  
W` classified *E. coli* in different serotype

1. Somatic "O"..... 171 sterotype of Somatic Ag

2. Flagellar "H" ..... 56 sterotype

3. Capsular "K" ..... 91 sterotype

### Somatic "O":-

- 1- Monophasic composed of one type of Ag composed of polysaccharide & phospholipids
- 2- Protein complex.
- 3- Not destroyed by alcohol
- 4- Not destroyed by heating at 120°C

### **"K" Ag :-**

- 1- They are divided into 3 type according to degree of thermolability
- 2- (B,L) type are inactivated at 100°C for 1 hr. While (A) Ag are thermostable in 120°C for 1/2 hr.
- 3- composed mainly of lipoprotein.

### "H" Ag

- 1- Monophasic sensitive to heat on 56°C heat & alcohol sensitive.

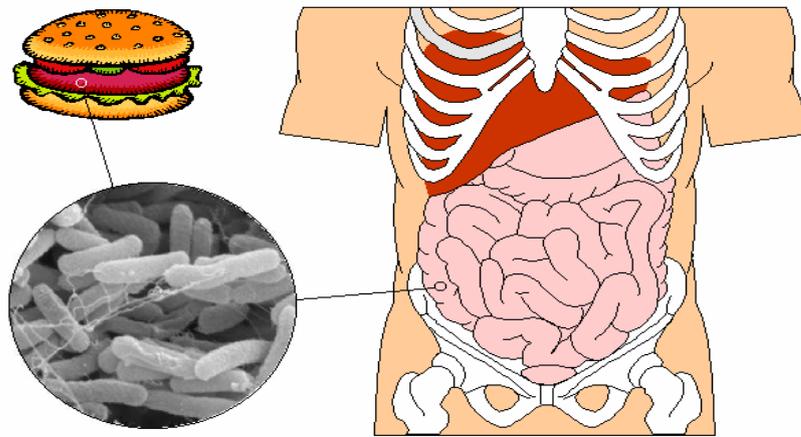
### Fimbrial Ag :-

- 1-Sometimes occur in some species of *E. coli* especially F4, F5, F41 w` is highly pathogenic type causing adhesion of organism in intestinal mucosa.
- 2-for application of serological test for sterotype polyvalent "O", "H" ,"K" antisera.

3-monovalent antisera is used by slide agglutination test for complicate serological identification for *E. coli*

4- O111 & O55 is highly pathogenic.

### Disease caused by *E. coli*:-



Cause wound infection - appendicitis - peritonitis affection

1- Pathogenic *E. coli* has been isolated by cases of urological, gynecological, gastroenteritis, endotoxic shock

2- In calves organism causes colibacillosis or white scour characterized by sever gastroenteritis, grayish, white diarrhea e` septicemia and calves usually dies within few hr.

3- In equine especially in foals. Organism associated e` streptococcal infection causing joint ill disease or naval ill disease.

4- In birds organism causes coli septicemia or coligranuloma (Hijaeraes disease) characterized by granumlatous disease. In digestive system. Specially liver .

## Laboratory diagnosis:-



### 1-Sample: \_

Urine or pus or stools

**2- Isolation** of org. from intestinal tract or affected lesion on macConkey agar media after colonies appear examines morphological and cultural character. (as in general character)

### 3- Biochemical reaction

### 4- Serological typing.

### 5- Toxin production by animal model or ELISA

N.B : Enteropathogenic strain cause children gastroenteritis while Entero toxigenic , Enteroinvasive & enter haemorrhagic → diarrhea in all age .