



## STUDY OF SEASONAL BIOLOGICAL BACTERIAL INTESTINAL INFECTIONS IN THE EXAMPLE OF ESHERICHIA

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**Abstract:** The family of intestinal bacteria includes bacteria that are very close to each other from an evolutionary point of view, but differ in pathogenicity and some characteristics, mainly living in the intestines of humans or vertebrates. Enterobacteria (Enterobacteriaceae) family includes 14 genera: Escherichia; Klebsiella; Proteus, Yersinia, Erwinia, Shigella, Salmonella, Enterobacter, Citrobacter, Hafnia, Serratia, Pro'idencia, Morganella, Edwarosiela. The seed is divided into types, and the type is divided into biological, serological, hemological and other options.

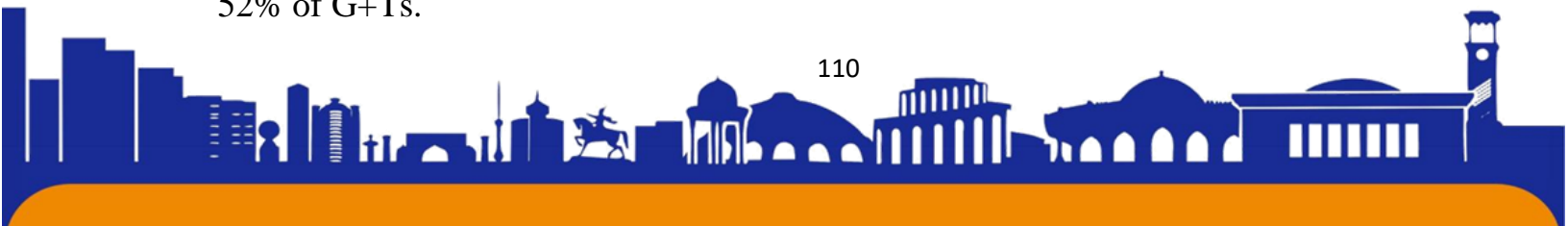
**Key words:** Escherichia; Klebsiella; Proteus, Yersinia, Erwinia, Shigella, Salmonella, Enterobacter, Citrobacter, Hafnia, Serratia, Pro'idencia, Morganella, Edwarosiela

### **Main part:**

The genus Escherichia consists of species E.coli, E.fergusonii, E.hermannii, E.vulneris and E.blattae (found in the intestinal tract), which differ from each other in terms of biochemical and physiological characteristics.

Morphology. According to its morphology, the intestinal bacillus is similar to enterobacteria belonging to the family Enterobacteriaceae, its size is 1.1–1.5x2.0–6.0 μm. Some of these strains are mobile (peritrix), and some are non-motile, i.e. they do not have hifchins. Currently, 30% of pathogenic escherichia have genital cilia. Some strains form microcapsules or slimy capsules. Grammeaceous, does not form spores.

The bacterial cell is covered with small hairs (fibrils). Nucleoid DNA contains 48-52% of G+Ts.





**Growth.** E.coli is a facultative anaerobe, grows well at a temperature of 37°C and a pH of 7.2–7.5. Escherichia remain active at 22–37°C, but growth stops at low temperatures. They form S-shaped colonies on meat-peptone agar, round in shape, clear and shiny in color, with raised edges, 1-2 mm in diameter. But R-shaped colonies can be formed at the expense of mutants, in which case they lose their basic biological properties.

In meat-peptone broth, it multiplies by forming a thick, then precipitate. Escherichia coli forms colonies of different colors depending on their composition in differential nutrient media. For example: Dark red shiny colonies in Endo medium are formed due to Escherichia coli breaking down the lactose in the medium.

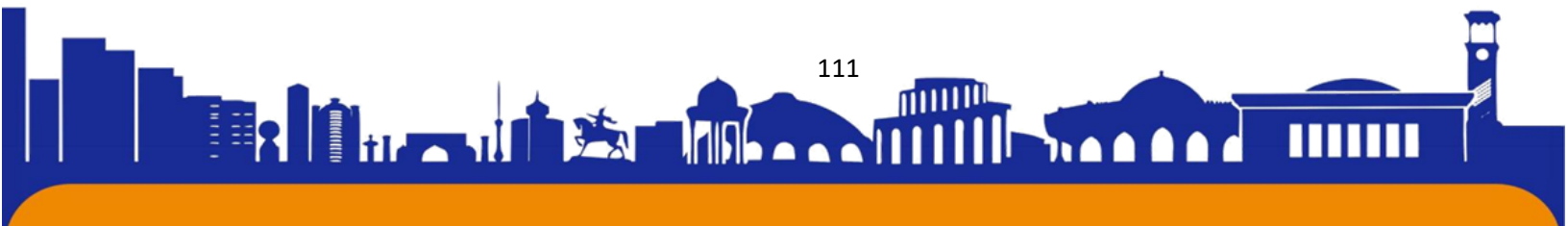
**Pathogenesis in humans.** Escherichia coli are conditionally pathogenic microorganisms. They have commensal species that do not cause disease in normal conditions.

Escherichia coli are antagonistic to typhoid, paratyphoid, enteric and enteric pus-forming bacteria. In addition, they synthesize substances, enzymes and vitamins necessary for the body. Biological preparations (colibacterin, coli-autovaccin) used for the treatment and prevention of intestinal diseases are prepared using the properties of escherichia coli to stop the reproduction of pathogenic microbes belonging to the family of enterobacteria.

Pathogenic Escherichia coli causes infectious diseases that differ in severity and duration of clinical symptoms. Escherichia coli is mainly the causative agent of coli-enteritis.

The source of infection is the patient and bacterial carriers. The pathogenic microbe is transmitted by alimentary route, sometimes through indirect contact, airborne droplets and dust. The main route of transmission is fecal-oral, in which a person gets sick through contaminated food and water. Coli-enteritis often occurs in infants and young children. Premature, artificially fed, unmedicated, rickets and hypotrophic children are affected by this disease. The causative agent of coli-enteritis in children is Escherichia coli 025, 026, 044, 055, 086, 091, 0111, 0114, 0119, 0125, 0126, 0127, 0128, 0141, 0146 and other serogroups.

Escherichia coli 023, 028, 032, 0115, 0124, 0136, 0143, 0144, 0151 and other serogroups are the causative agents of the serotype, which are similar to the causative agents of serotype in some biological characteristics.





Enteropathogenic escherichia also cause a plague-like disease. Enterotoxin-producing escherichia 01, 06, 015, 025, 078, 0148 and other serogroups are the causative agents of cholera, they produce heat-resistant and resistant enterotoxins. Enteropathogenic escherichia serogroups 02, 06, 07, 09, 011, 015, 075 cause urinary tract infections, serogroups 01, 08, 011 cause cholecystitis, serogroups 01, 02, 08 cause appendicitis. In addition, pathogenic Escherichia cause peritonitis, sepsis, septic shock, cystitis, meningitis, pyelitis, otitis, and food poisoning.

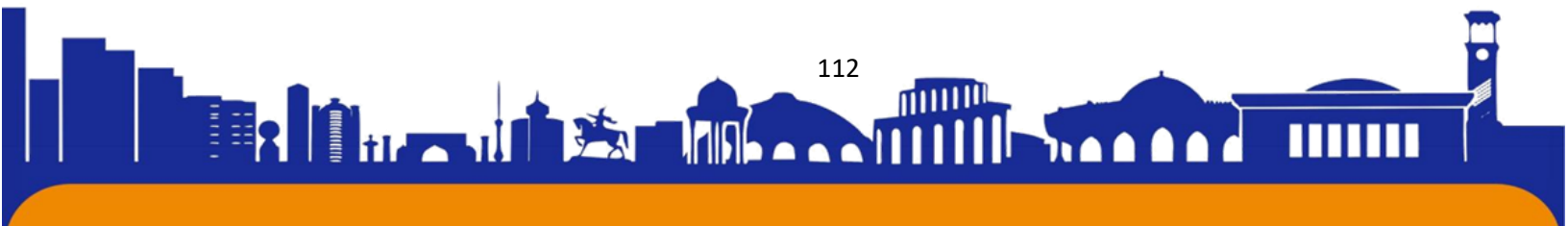
Coli-enteritis and cholera-like pathogens multiply on the surface of the intestinal epithelial cell, while enteric-like pathogens such as shigella multiply inside the epithelial cells. As a result of the death of bacteria, a large amount of pyrogenic endotoxins is formed. Cholera pathogens secrete enterotoxin. This increases the activity of cholera-like adenyl acetylase, as a result of which acetyladenosine monophosphate (TsAMF) accumulates and the permeability of intestinal epithelia is disturbed, causing acute diarrhea. A heat-stable enterotoxin catalyzes guanylyltransferase to form StAMF.

Now enteroinvasive, enteropathogenic, enterohemorrhagic, enterotoxigenic and enteroadhesive types of E.coli are distinguished. Their various properties are provided by plasmids and bacteriophages.

Immunity. Immunity to coli infection in young children has not been thoroughly studied, after the disease, type-specific weak immunity appears.

Due to the fact that the cross is not immune, a person can be infected with coli infection several times in his life. Due to the presence of microcapsules of E.coli, the decrease in the activity of phagocytosing cells is also the reason for the weakness of the immune system in coli infection.

**Laboratory diagnosis.** To make a microbiological diagnosis of colienteritis and other coli infections, the patient's excrement, nasopharyngeal smear, blood, bile, liver, spleen, lung, small and large intestine, and pus are examined from the corpse. The material to be tested is planted in solid nutrient media (Endo, Levina, etc.) and additional typhus and paratyphus, Ploskirev, bismuth-sulfite agars growing gonorrhoea bacteria. If sepsis is suspected, then the blood is cultured first in broth, and then in a suitable solid nutrient medium. To differentiate the isolated pure culture, its morphology, growth, biochemical and serological characteristics are checked.





In order to determine the O-group of the isolated escherichia, first, the test sample is boiled, in which the K-antigen is decomposed, then an agglutination reaction is performed, in which OK- and O-sera are used.

Immunofluorescent reaction is used for rapid identification of isolated culture or material to be examined. The result can be determined within 1-2 hours.

In order to make a serological diagnosis of colienteritis, an indirect hemagglutinin test is used. If the diagnostic titer of the reaction increases, this is considered a positive result.

**Treatment and prevention.** Patients suffering from coli infection are given antibiotics (tetrastictin, levomisetin, polymyxin, nitromystin, etc.). In addition, biological preparations: coli-autovaccin, colibacterin, lactobacterin, bificol, bifidumbacterin are used.

To prevent coli infection, it is important to quickly identify patients, hospitalize them and treat them accordingly. Therefore, it is necessary to regularly conduct periodic medical examinations of employees and cooks of children's institutions (dispensary), strict adherence to sanitary and hygienic rules in milk preparation kitchens, maternity wards, kindergartens and nurseries: water, food, ensuring that wet fruit is not contaminated is important in disease prevention. Special prophylaxis against coli infection has not been developed.

E.coli is a sanitary indicator microorganism. Therefore, it should not be found in water, food, non-alcoholic beverages, and various products. Coli titer and coli index are determined to check the presence of Escherichia coli in water, food products, and soil.

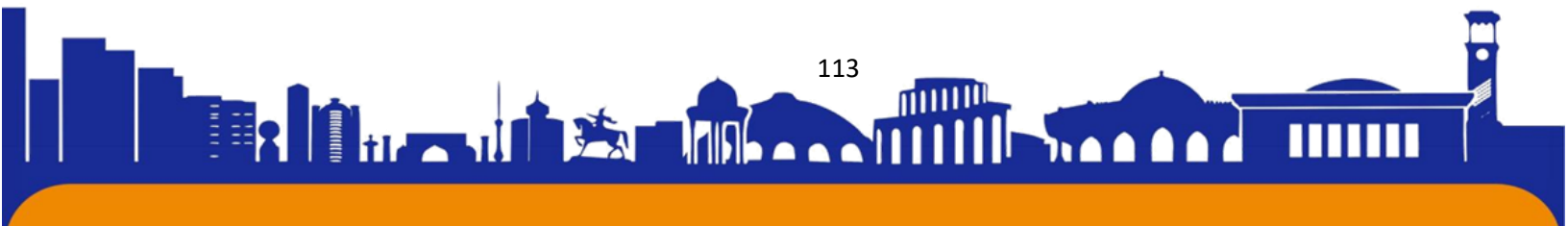
Coli titer refers to the smallest volume of liquid in which one E. coli particle is found (normally 250-300 ml).

Coli-index is the number of E.coli found in 1 l of liquid (usually up to 3-4).

### Situational problem 1

A 1.5-year-old patient came to the children's hospital. Symptoms of dehydration and intoxication in the child's body. Vomiting and diarrhea were observed. The doctor suspects a coli infection.

- Assess the taxonomic status of the pathogen.
- How do you explain profuse diarrhea in a child?





- Enterobacteria (Enterobacteriaceae) family includes 14 genera: Escherichia; Klebsiella; Proteus, Yersinia, Erwinia, Shigella, Salmonella, Enterobacter, Citrobacter, Hafnia, Serratia, Providencia, Morganella, Edwardsiella. The seed is divided into types, and the type is divided into biological, serological, hemological and other options.

- The causative agents of coli-enteritis and cholera-like diseases multiply on the surface of the intestinal epithelial cell, and the causative agents of enteric-like diseases such as shigella multiply inside the epithelial cells. As a result of the death of bacteria, a large amount of pyrogenic endotoxins is formed. Cholera pathogens secrete enterotoxin. This increases the activity of cholera-like adenyl cyclase, as a result of which cyclic adenosine monophosphate (cAMP) accumulates and the permeability of intestinal epithelia is disturbed, causing acute diarrhea. A heat-stable enterotoxin catalyzes guanylyl cyclase to form StAMP.

### Situational problem 2

Buck. Feces of a child with severe diarrhea were brought to the laboratory. Blood was found in the feces. E-coli was found on examination.

- Which type of E-coli causes bloody diarrhea.
- As a result of which characteristics of Escherichia coli, bloody diarrhea is observed
- How are diseases caused by Escherichia coli mainly investigated?

1. Escherichia coli O23, O28, O32, O115, O124, O136, O143, O144, O151 and other serogroups of the causative agents of a disease similar to cholera, which are similar to the causative agents of cholera with some biological characteristics looks like

2. Diagnostics of escherichia: evaluation of the result of growth in Endo medium cultured with patient material suspected of escherichia.

a) To assess the cultural characteristics, to determine the morphological and tinctorial characteristics of the culture in the Gram-stained preparation.

b) Sowing from Endo medium on 3-sugar agar in order to study the enzymatic properties.

c) In order to determine the antigenic affiliation of the causative agent, performing an agglutination reaction on a slide with sera specific to the agglutinating type (O26, O55, O111).





**References:**

1. Muhamedov I.M, Aliev SH.R. va boshq. Mikrobiologiya, virusologiya va immunologiya. Darslik. Toshkent. 2019 y.
2. Под редакцией профессора Мухамедова И.М. “Медицинская микробиология, вирусология и иммунология”. Тошкент -2011 г. Учебник.
3. Aliev Sh.R., Nuruzova Z.A. “Mikrobiologiyadan laboratoriya mashg‘ulotlariga doir O‘quv-uslubiy qo‘llanma” Toshkent. 2019 y.
4. Muhamedov I., Eshboyev E., Zokirov N, Zokirov M. “Mikrobiologiya, immunologiya, virusologiya”. Toshkent - 2006. Darslik.
5. Tashboltayevna A. S. et al. LEISHMANIOSIS DISEASE, ITS SYMPTOMS, PRIMARY CONSEQUENCES AND DISTRIBUTION //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 12. – С. 836-838.
6. Tashboltayevna A. S. et al. LEISHMANIOSIS DISEASE, ITS SYMPTOMS, PRIMARY CONSEQUENCES AND DISTRIBUTION //Galaxy International Interdisciplinary Research Journal. – 2022. – Т. 10. – №. 12. – С. 836-838.
7. Tashboltayevna A. S., Mirzaali o‘g‘li A. J., Bahromjon o‘g‘li F. N. SIFILIS (ZAXM) KASALLIGI, UNING ALOMATLARI VA BIRLAMCHI OQIBATLARI //PEDAGOGICAL SCIENCES AND TEACHING METHODS. – 2022. – Т. 2. – №. 17. – С. 153-155.

