

SUPPLEMENTARY MATERIALS

Table S1. Primers used to detect virulence factor-encoding genes in the uropathogenic *E. coli* (UPEC) isolates studied.

Virulence factors investigated	Target gene	Primers sequence (5' → 3')	Amplicon size (bp)	References
Adhesins				
Type 1 fimbriae	<i>fimH</i>	TGCAGAACGGATAAGCCGTGG GCAGTCACCTGCCCTCCGGTA	508	[74]
P fimbriae	<i>papA</i>	ATGGCAGTGGTGTCTTTTGGTG CGTCCCACCATACGTGCTCTTC	720	[74]
	<i>papC</i>	GACGGCTGTACTGCAGGGTGTGGCG ATATCCTTTCTGCAGGGATGCAATA	328	[75]
Afa/Dr adhesins	<i>afaBC</i>	GCTGGGCAGCAAACCTGATAACTCTC CATCAAGCTGTTTGTTTCGTCCGCCG	750	[75]
S/F1C fimbriae	<i>sfa/focDE</i>	CGGAGGAGTAATTACAAACCTGGCA CTCCGGAGAACTGGGTGCATCTTAC	410	[75]
<i>E. coli</i> common pilus (ECP)	<i>ecpA</i>	GCAACAGCCAAAAAAGACACC CCAGGTCGCGTCGAACT	477	[76]
IrgA homologue adhesin	<i>iha</i>	CAGGTCGGGGTTACCAAGT CAAATGGCTCTCTTCCGTCAATGC	925	[77]
Heat-resistant agglutinin	<i>hra</i>	TCACTTGCAGACCAGCGTTTC GTAACTCACACTGCTGTCACCT	537	[77]
M-agglutinin	<i>bmaE</i>	ATGGCGCTAACTTGCCATGCTG AGGGGGACATATAGCCCCCTTC	507	[74]
Invasin				
Invasion of brain endothelium	<i>ibeA</i>	AGGCAGGTGTGCGCCGCGTAC TGGTGCTCCGGCAAACCATGC	170	[74]

Table S1. Continued

Virulence factors investigated	Target gene	Primers sequence (5' → 3')	Amplicon size (bp)	References
Toxins				
Hemolysin A	<i>hlyA</i>	AACAAGGATAAGCACTGTTCTGGCT ACCATATAAGCGGTCATTCCCGTCA	1177	[74]
Cytotoxic necrotizing factor 1	<i>cnfI</i>	AAGATGGAGTTTCCTATGCAGGAG CATTGAGAGTCCTGCCCTCATTATT	498	[79]
Cytolethal distending toxin	<i>cdt</i>	GAAARTAAATGGAAYAYAMATGTCCG AATCWCCWRSATCATCCAGTTA	466	[80]
Secreted autotransporter toxin	<i>sat</i>	TGCTGGCTCTGGAGGAAC TTGAACATTGAGAGTACCGGG	667	[78]
vacuolating autotransporter toxin	<i>vat</i>	AACGGTTGGTGGCAACAATCC AGCCCTGTAGAATGGCGAGTA	420	[81]
Uropathogenic specific protein	<i>usp</i>	ACATTCACGGCAAGCCTCAG AGCGAGTTCCTGGTGAAAGC	448	[82]
Protein involved in colonization (Pic) from UPEC	<i>picU</i>	TCAGGCCCGTAAGAACAGCAAAAT ACGGTAAGAGTGTGGATGGCGGAGTC	372	[83]
Temperature-sensitive hemagglutinin	<i>tsh</i>	ACTATTCTCTGCAGGAAGTC CTTCCGATGTTCTGAACGT	824	[84]
Hemolysin F	<i>hlyF</i>	GGCGATTTAGGCATTCCGATACTC ACGGGGTCGCTAGTTAAGGAG	599	[85]
Iron acquisition				
Salmochelins	<i>iroN</i>	AAGTCAAAGCAGGGGTTGCCCCG GACGCCGACATTAAGACGCAG	665	[86]
Yersiniabactin	<i>irp2</i>	AAGGATTCGCTGTTACCGGAC TCGTCCGGGCAGCGTTTCTTCT	264	[87]
Aerobactin	<i>iucD</i>	AAGTGTCGATTTTATTGGTGTA CCATCCGATGTCAGTTTTCTG	760	[88]
Siderophore receptor IreA	<i>ireA</i>	ATTGCCGTGATGTGTTCTGC CACGGATCACTTCAATGCGT	384	[78]
Periplasmic iron-binding protein	<i>sitA</i>	AGGGGGCACAACCTGATTCTCG TACCGGGCCGTTTTCTGTGC	608	[89]

Table S1. Continued

Virulence factors investigated	Target gene	Primers sequence (5' → 3')	Amplicon size (bp)	References
Protectins				
Surface exclusion protein	<i>traT</i>	GGTGTGGTGCGATGAGCACAG CACGGTTCAGCCATCCCTGAG	290	[74]
Outer membrane protease T	<i>ompT</i>	ATCTAGCCGAAGAAGGAGGC CCCGGGTCATAGTGTTTCATC	559	[90]
Increased serum survival	<i>iss</i>	ATCACATAGGATTCTGCCG CAGCGGAGTATAGATGCCA	309	[91]
Group II capsule	<i>kpsMTII</i>	GCGCATTTGCTGATACTGTTG CATCCAGACGATAAGCATGAGCA	272	[74]
Colicin V	<i>cvi/cvaC</i>	TCCAAGCGGACCCCTTATAG CGCAGCATAGTTCCATGCT	597	[78]

Table S2. Primers used to detect virulence factor-encoding genes associated with the distinct diarrheagenic *E. coli* (DEC) pathotypes.

DEC pathotype ^a	Target gene	Primers sequence (5' → 3')	Amplicon size (bp)	References
EPEC/EHEC	<i>escN</i>	CGACGACTATTGCAGAGT GCCTTATCTGCTTCAGGA	499	[92]
Typical EPEC	<i>bfpB</i>	GACACCTCATTGCTGAAGTCG CCAGAACACCTCCGTTATGC	910	[93]
STEC	<i>stx1/2</i>	GAGCGAAATAATTTATATGTG TGATGATGGCAATTCAGTAT	518	[94]
EAEC	<i>aatA</i>	CTGGCGAAAGACTGTATCAT	630	[95]
	<i>aggR</i> ^b	CAATGTATAGAAATCCGCTGTT	254	[96]
		GTATACACAAAAGAAGGAAGC ACAGAATCGTCAGCATCAGC		

^aDiarrheagenic *E. coli* (DEC) pathotypes investigated: EPEC: enteropathogenic *E. coli*, STEC: shiga toxin-producing *E. coli*, and EAEC: enteroaggregative *E. coli*. EHEC (enterohemorrhagic *E. coli*) is a subgroup of the STEC pathotype that besides the shiga toxin-encoding genes (*stx1* and/or *stx2*), also harbor the LEE (locus of enterocyte effacement) region (*escN*⁺).

^bThe *aggR* gene, encoding a transcriptional regulator, is used to differentiate typical (*aatA*⁺/*aggR*⁺) than atypical (*aatA*⁺/*aggR*⁻) EAEC isolates.

Table S3. Primers used to detect β -lactamase-encoding genes in the Extended Spectrum Beta-Lactamases (ESBL)-producing uropathogenic *E. coli* (UPEC) isolates identified in this study.

Target gene	Primers sequence (5' → 3')	Amplicon size (bp)	References
<i>bla_{SHV}</i>	ATTTGTCGCTTCTTTACTCGC TTTATGGCGTTACCTTTGACC	1051	[97]
<i>bla_{TEM-1}</i>	ATGAGTATTCAACATTTCCTG TTACCAATGCTTAATCAGTGAG	840	[98]
<i>bla_{CTX-M-2-group}</i>	AAATGTGCTGCTCCTTTTCGTGAGC AGGGTTCGTTGCAAGACAAGACTG	1112	[99]
<i>bla_{CTX-M-8-group}</i>	GCAAGCGCATTTTTGTTTTT GACGACTTTCTGCCTTCTGC	900	[100]
<i>bla_{CTX-M-15-group}</i>	CACACGTGGAATTTAGGGACT GCCGTCTAAGGCGATAAACA	499	[101]
<i>bla_{CMY-2}</i>	ATGATGAAAAAATCGTTATGCT TTATTGCAGCTTTTCAAGAATGCG	1140	[102]

Table S4. Age, gender and clinical diagnosis of the outpatients with urinary tract infections included in this study.

Age and Clinical diagnosis	No. of Patients (%)		
	Patients Gender:		Total
	Male (<i>n</i> = 11)	Female (<i>n</i> = 101)	(<i>n</i> = 112)
Age range			
0-10	3 (27.3)	6 (5.9)	9 (8.0)
11-17	1 (9.1)	7 (6.9)	8 (7.1)
18-40	0	33 (32.7)	33 (29.5)
41-65	2 (18.2)	33 (32.7)	35 (31.3)
> 65	5 (45.4)	22 (21.8)	27 (24.1)
Clinical diagnosis			
Cystitis	8 (72.7)	79 (78.2)	87 (77.7)
Pyelonephritis	2 (18.2)	9 (8.9)	11 (9.8)
Asymptomatic bacteriuria (ABU)	1 (9.1)	10 (9.9)	11 (9.8)
No information available	0	3 (3.0)	3 (2.7)

Table S5. Serotypes and *E. coli* phylogroups of the uropathogenic *E. coli* (UPEC) isolates studied.

Serogroup ^a	H type ^b	Phylogroup	UPEC Identification ^c	No. of Isolates (%)
O1	H7	F	87	1 (0.9)
	H25	F	12	1 (0.9)
	HNM	D	53	1 (0.9)
O2	H7	B2	25, 80	2 (1.8)
O3	H2	A	34	1 (0.9)
O4	H4	B2	8, 68	2 (1.8)
O6	H1	B2	2, 24, 32, 71, 75, 76, 99, 102	8 (7.1)
	H31	B2	27, 45, 74, 88, 96	5 (4.5)
	HNM	B2	50	1 (0.9)
O8	H40	B1	62	1 (0.9)
O15	H2	G	6	1 (0.9)
	H6	D	69	1 (0.9)
O16	H5	B2	33	1 (0.9)
O17	H18	D	4	1 (0.9)
O18	H7	B2	5	1 (0.9)
	H31	B2	26, 35	2 (1.8)
O20	H9	C	15	1 (0.9)
O21	H12	A	7	1 (0.9)
	H21	B1	49	1 (0.9)
	HNM	B2	29	1 (0.9)
O25	H4	B2	18, 21, 28, 89, 90, 101, 114, 117	8 (7.1)
	H18	G	108	1 (0.9)
	HNM	A	118	1 (0.9)
O55	H8	G	48	1 (0.9)
O75	HNM	B2	23	1 (0.9)
O81	H14	B1	58	1 (0.9)
O82	H18	D	3	1 (0.9)
O83	H4	B2	73	1 (0.9)
	H33	B2	70	1 (0.9)
O84	H14	B1	13	1 (0.9)
O86	H2	D	22, 41	2 (1.8)
O90	H2	D	100	1 (0.9)
O101	HNM	A	109	1 (0.9)
O103	H7	B1	14	1 (0.9)
O110	H28	B1	107	1 (0.9)
O126	H10	B1	85	1 (0.9)
O139	H19	B1	81	1 (0.9)
O145	H34	B2	92	1 (0.9)
O153	H2	D	59	1 (0.9)
O160	H11	B1	52	1 (0.9)
O164	HNM	F	78	1 (0.9)
O172	H5	B2	31	1 (0.9)

Table S5. *Continued*

Serogroup ^a	H type ^b	Phylogroup	UPEC Identification ^c	No. of Isolates (%)
ONT	H1	B2	47	1 (0.9)
	H4	A	112	1 (0.9)
		B2	9, 116	2 (1.8)
		G	40	1 (0.9)
	H5	A	44	1 (0.9)
	H7	A	61	1 (0.9)
		B1	54	1 (0.9)
		B2	82, 97	2 (1.8)
	H8	E	110	1 (0.9)
	H9	C	72	1 (0.9)
	H14	D	115	1 (0.9)
	H18	B1	57	1 (0.9)
		D	38, 113, 119	3 (2.7)
	H25	B1	37	1 (0.9)
	H30	E	91	1 (0.9)
	HNM	A	17, 19, 20, 30, 36, 65, 79, 93	8 (7.1)
		B1	16	1 (0.9)
		B2	42	1 (0.9)
		F	63	1 (0.9)
		<i>E. clades</i>	10, 60	2 (1.8)
OR	H4	B1	94	1 (0.9)
		B2	39, 56	2 (1.8)
		D	111	1 (0.9)
	H6	F	120	1 (0.9)
	H10	B1	51	1 (0.9)
	H18	B2	46, 106	2 (1.8)
	H33	A	95	1 (0.9)
	H34	F	43	1 (0.9)
	H45	D	64	1 (0.9)
	H51	B1	55	1 (0.9)
	HNM	A	11, 98	2 (1.8)
		F	1, 103	2 (1.8)

^aONT: O-non-typeable and OR: rough (autoagglutinable) isolates

^bHNM: non-motile UPEC isolates.

^cEight UPEC isolates (UPEC identification: 66, 67, 77, 83, 84, 86, 104 and 105) were not evaluated in the present study.

Table S6. Resistance profile of the 31 uropathogenic *E. coli* (UPEC) isolates with multidrug-resistance (MDR) phenotype.

UPEC identification ^a	Classes of Antimicrobial Drugs ^{b,c} :					
	β -Lactam	Aminoglycoside	Quinolone/ Fluoroquinolone	Folic acid Metabolism inhibitor	Nitrofurantoin	Phosphonic acid derivative
10	AMP (R), CFL (R), CRX (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
15	AMP (R), ASB (R), AMC (I), CFL (I)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
18	AMP (R)	GEN (R)	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
19	AMP (R), CFL (I)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
20	AMP (R), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
21	CFL (I)	GEN (I), AMI (I)	CIP (I)	-	-	-
23	AMP (R), AMC (I), CFL (R), CPM (I)	AMI (I)	NAL (R), NOR (R), CIP (R)	-	-	-
26	AMP (R), ASB (R), AMC (I), CFL (R)	-	CIP (I)	SUT (R)	-	-
30	AMP (R), CFL (R), CRX (R), CAZ (I), CTX (R), CPM (R)	AMI (I)	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
37	AMP (R)	AMI (I)	NAL (R), CIP (I)	SUT (R)	-	-
43	AMP (R), AMC (R), CFL (R), CRX (R)	GEN (R)	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
48	AMP (R), CFL (I)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
49	AMP (R), ASB (I), AMC (I), CFL (I)	-	CIP (I)	SUT (R)	-	-
55	AMP (R), PPT (I), AMC (R), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	FOS (R)
57	AMP (R), ASB (R), AMC (I), CFL (I)	GEN (R)	-	SUT (R)	-	-
60	AMP (R), ASB (I), AMC (R), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
71	CFL (I)	AMI (I)	NAL (I), CIP (R)	-	-	-
72	CFL (I)	-	NAL (R), CIP (R)	SUT (R)	-	-

Table S6. Continued

UPEC identification ^a	Classes of Antimicrobial Drugs ^{b,c} :					
	β -Lactam	Aminoglycoside	Quinolone/ Fluoroquinolone	Folic acid Metabolism inhibitor	Nitrofurantoin	Phosphonic acid derivative
82	AMP (R), ASB (I), AMC (I), CFL (I)	-	NAL (R), CIP (R)	SUT (R)	-	-
85	AMP (R), ASB (R), AMC (I), CFL (R), CRX (R), CTX (R), CPM (R)	GEN (I)	NAL (I), CIP (R)	SUR (R)	-	-
89	AMP (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
90	AMP (R), CFL (I)	GEN (I)	NAL (R), NOR (R), CIP (R)	-	-	-
94	AMP (R), AMC (R), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
99	CFL (I)	GEN (I)	NAL (R), CIP (I)	-	-	-
100	AMP (R), CFL (I)	GEN (I)	NAL (I)	SUT (R)	-	-
101	AMP (R)	GEN (I)	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
109	AMP (R), ASB (I), CFL (R), CRX (R), CTX (R), CPM (R)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
112	AMP (R), ASB (I), AMC (I), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	GEN (R)	NAL (R), NOR (R), CIP (R)	SUT (R)	NIT (I)	-
114	AMP (R), ASB (I), AMC (I), CFL (R), CRX (R), CAZ (R), CTX (R), CPM (R)	GEN (R)	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-
119	AMP (R), CFL (R)	GEN (I)	-	SUT (R)	-	-
120	AMP (R), CFL (R), CRX (R), CTX (R), CPM (I)	-	NAL (R), NOR (R), CIP (R)	SUT (R)	-	-

^aESBL-producing UPEC isolates: 10, 20, 30, 55, 60, 85, 94, 109, 112, 114, and 120.

^bClasses of antimicrobial drugs: **β -Lactams**: ampicillin (AMP), Piperacillin/Tazobactam (PPT), ampicillin/sulbactam (ASB), amoxicillin/clavulanic acid (AMC). cephalothin (CFL), cefuroxime (CRX), ceftazidime (CAZ), cefotaxime (CTX), cefepime (CPM); **Aminoglycoside**: gentamicin (GEN), amikacin (AMI); **Quinolones**: nalidixic acid (NAL), norfloxacin (NOR), ciprofloxacin (CIP); **Folic acid metabolism inhibitors**: trimethoprim/sulfamethoxazole (SUT); **Nitrofurantoin**: nitrofurantoin (NIT); and **Phosphonic acid derivative**: fosfomycin (FOS).

^cLetters in parentheses indicate: resistant (R) or intermediate (I).