

Supplementary Table 1. Primers and PCR conditions used in this study for multi locus sequence typing.

Genes	Primer name and sequence (5' to 3')	Product size (bp)	PCR conditions			Reference
<i>adk</i>	adk-P1	584	95 °C	3 min	1×	Wirth et al., 2006
	ATTCTGCTTGGCGCTCCGGG		94 °C	0.5 min		
	adk-P2		52 °C	0.5 min	30×	
	CCGTCAACTTTCGCGTATTT		72 °C	0.75 min		
			72 °C	7 min	1×	
<i>fumC</i>	fumC-P1	806	95 °C	3 min	1×	Wirth et al., 2006
	TCACAGGTCGCCAGCGCTTC		94 °C	0.5 min		
	FumC-P2		55 °C	0.5 min	30×	
	GTACGCAGCGAAAAAGATTC		72 °C	1 min		
			72 °C	7 min	1×	
<i>gyrB</i>	gyrB-P1	815	95 °C	3 min	1×	Wirth et al., 2006
	TCGGCGACACGGATGACGGC		94 °C	0.5 min		
	gyrB-R		58 °C	0.5 min	30×	Lau et al., 2008
	GTCCATGTAGGCGTTCAGGG		72 °C	0.75 min		
			72 °C	7 min	1×	
<i>icd</i>	icd-P1	878	95 °C	3 min	1×	Wirth et al., 2006
	ATGGAAAGTAAAGTAGTTGTTCCGGCACA		94 °C	0.5 min		
	icd-P2		54 °C	0.5 min	30×	
	GGACGCAGCAGGATCTGTT		72 °C	1 min		
			72 °C	7 min	1×	
<i>mdh</i>	mdh-P1	932	95 °C	3 min	1×	Wirth et al., 2006
	ATGAAAGTCGCAGTCCTCGGCGCTGCTGGCGG		94 °C	0.5 min		
	mdh-P2		68 °C	0.5 min	30×	
	TTAACGAACTCCTGCCCCAGAGCGATATCTTTCTT		72 °C	0.75 min		
			72 °C	7 min	1×	
<i>purA</i>	purA-P1	817	95 °C	3 min	1×	Wirth et al., 2006
	CGCGCTGATGAAAGAGATGA		94 °C	0.5 min		
	purA-P2		50 °C	0.5 min	30×	
	CATACGGTAAGCCACGCAGA		72 °C	0.75 min		
			72 °C	7 min	1×	
<i>recA</i>	RecA-F	606	95 °C	3 min	1×	Lau et al., 2008
	AGCGTGAAGGTAAAACCTGTG		94 °C	0.5 min		
	recA-P2		54 °C	0.5 min	30×	Wirth et al., 2006
	TCTCGATCAGCTTCTCTTTT		72 °C	0.75 min		
			72 °C	7 min	1×	

Supplementary Table 2. Primers and PCR conditions used in this study to detect virulence-associated genes.

Genes	Primer name and sequence (5' to 3')	Product size (bp)	PCR conditions			Reference
<i>cnf1</i>	CNF1-1	1295	94 °C	4 min	1×	Kuhar et al., 1998
	CTGACTTGCCGTGGTTTAGTCGG		94 °C	1.5 min		
	CNF1-2		59 °C	1.5 min	30×	
	TACACTATTGACATGCTGCCCGGA		72 °C	2 min		
			72 °C	5 min	1×	
<i>hlyA</i>	hlyA.1	1177	95 °C	2.5 min	1×	Yamamoto et al., 1995
	AACAAGGATAAGCACTGTTCTGGCT		94 °C	0.5 min		
	hlyA.2		64 °C	0.5 min	30×	
	ACCATATAAGCGGTCATTCCCGTCA		72 °C	1.5 min		
			72 °C	7 min	1×	
<i>usp</i>	USPdeg 1	1017	95 °C	5 min	1×	Personal communication dr. Jerneja Ambrožič Avguštin
	ATGCTACTGTTCCGGGTAGTSTGT		95 °C	0.5 min		
	USPdeg 2		56 °C	0.5 min	30×	
	CATCRTGTAGTCKGGGSGTAACAAT		72 °C	1.5 min		
			72 °C	7 min	1×	
<i>ibeA</i>	Ibe10_f	170	94 °C	2.5 min	1×	Huang <i>et al.</i> , 1995
	AGGCAGGTGTGCGCCGCGTAC		94 °C	0.5 min		
	IbeA_r		63 °C	0.5 min	25×	Johnson & Stell, 2000
	TGGTGCTCCGGCAAACCATGC		72 °C	3 min		
			72 °C	10 min	1×	
<i>fimH</i>	FimH1	461	94 °C	2.5 min	1×	Starčič Erjavec et al., 2011
	CAGCGATGATTTCCAGTTTGTGTG		94 °C	0.5 min		
	FimH2		64 °C	0.5 min	30×	
	TGCGTACCAGCATTAGCAATGTCC		72 °C	0.5 min		
			72 °C	7 min	1×	
<i>papGII</i>	papG_II f	190	95 °C	2.5 min	1×	Johnson & Brown, 1996
	GGGATGAGCGGGCCTTTGAT		94 °C	0.5 min		
	papG_II r		55 °C	1 min	25×	
	CGGGCCCCCAAGTAACTCG		72 °C	0.5 min		
			72 °C	7 min	1×	

<i>papGIII</i>	papG_III f	258	94 °C	2.5 min	1×	Johnson & Brown, 1996
	GGCCTGCAATGGATTACCTGG		94 °C	0.5 min		
	papG_III r		63 °C	0.5 min	25×	
	CCACCAAATGACCATGCCAGAC		72 °C	3 min		
			72 °C	10 min	1×	
<i>sfaDE</i>	SFA-1	408	94 °C	3 min	1×	Le Bouguenec et al., 1992
	CTCCGGAGAACTGGGTGCATCTTAC		94 °C	2 min		
	SFA-2		65 °C	1 min	25×	
	CGGAGGAGTAATTACAAACCTGGCA		72 °C	2 min		
			72 °C	10 min	1×	
<i>afa/draBC</i>	afa/draBC-f	592	94 °C	4 min	1×	Johnson & Stell, 2000
	GGCAGAGGGCCGGCAACAGGC		94 °C	0.5 min		
	afa/draBC-r		63 °C	0.5 min	25×	
	CCCGTAACGCGCCAGCATCTC		72 °C	3 min		
			72 °C	10 min	1×	
<i>iucD</i>	Aer1	602	94 °C	4.5 min	1×	Yamamoto et al., 1995
	TACCGGATTGTCATATGCAGACCGT		94 °C	0.5 min		
	Aer2		62 °C	0.5 min	35×	
	AATATCTTCCCTCCAGTCCGGAGAAG		72 °C	50 sec		
			72 °C	10 min	1×	
<i>fyuA</i>	fyuA 1	785	94 °C	2.5 min	1×	Johnson & Stell, 2000;
	TGATTAACCCCGCGACGGGAA		94 °C	0.5 min		
	fyuA 2		63 °C	0.5 min	25×	
	CGCAGTAGGCACGATGTTGTA		72 °C	3 min		
			72 °C	10 min	1×	Schubert et al., 1998
<i>ireA</i>	ireA f	421	94 °C	2.5 min	1×	Russo et al., 2001
	TGGTCTTCAGCTATATGG		94 °C	0.5 min		
	ireA r		55 °C	1 min	25×	
	ATCTATGATTGIGTTGGT		72 °C	0.5 min		
			72 °C	7 min	1×	
<i>iha</i>	iha f	827	94 °C	4 min	1×	Johnson et al., 2000
	CTGGCGGAGGCTCTGAGATCA		94 °C	0.5 min		
	iha r		58 °C	0.5 min	30×	
	TCCTTAAGCTCCCGCGGCTGA		72 °C	1 min		
			72 °C	8 min	1×	

<i>hbp</i>	Hbp f	925	94 °C	4.5 min	1×	Starčič Erjavec et al., 2009
	GGTGAAGGTACGCTGACGGT		94 °C	0.5 min		
	Hbp r		65 °C	1 min	35×	
	GCGTGACGCTGGAGTTATCT		72 °C	1 min		
			72 °C	10 min	1×	
<i>iroN</i>	iroN f	668	94 °C	2.5 min	1×	Johnson et al., 2000
	AAGTCAAAGCAGGGTTGCCCG		94 °C	0.5 min		
	iroN r		68 °C	0.5 min	25×	
	GACGCCGACATTAAGACGCAG		72 °C	2 min		
			72 °C	10 min	1×	
<i>kpsMT</i>	kpsMT_II f	270	94 °C	4.5 min	1×	Johnson & Stell, 2000
	GCGCATTTGCTGATACTGTTG		94 °C	0.5 min		
	kpsMT_II r		64 °C	1 min	25×	
	CATCCAGACGATAAGCATGAGCA		72 °C	0.5 min		
			72 °C	7 min	1×	
<i>neuB</i>	neuB-F	493	94 °C	4.5 min	1×	Nowrouzian et al., 2001
	CTACCCCTTTTGACGAAGAC		94 °C	0.5 min		
	neuB-r		64 °C	0.5 min	30×	
	ACACACCTGACCCCAATAC		72 °C	1 min		
			72 °C	7 min	1×	
<i>tcpC</i>	tcpC-for	386	94 °C	4.5 min	1×	Cirl et al., 2008
	GGCAACAATATGTATAATATCCT		94 °C	0.5 min		
	tcpC-rev		60 °C	0.5 min	25×	
	GCCCAGTCTATTTCTGCTAAAGA		72 °C	1 min		
			72 °C	10 min	1×	
APEC- <i>ompT</i>	ompT-APEC f	581	94 °C	4.5 min	1×	This study
	CAGAGTATCTGTCGGTGCCTCA		94 °C	0.5 min		
	ompT-APEC r		60 °C	1 min	25×	
	TACGGTCCATGTTCCCTTCGAC		72 °C	1 min		
			72 °C	10 min	1×	
<i>ompT</i>	ompT f	559	95 °C	4 min	1×	Foxman et al., 1995
	ATCTAGCCGAAGAAGGAGGC		94 °C	0.5 min		
	ompT r		57 °C	1 min	25×	
	CCCGGGTCATAGTGTCATC		72 °C	1 min		
			72 °C	10 min	1×	

<i>clbA</i>	IHAPJPN42	1002	94 °C	4.5 min	1×	Johnson et al., 2008
	CAGATACACAGATACCATTCA		94 °C	0.5 min		
	IHAPJPN46		57 °C	0.5 min	30×	
	CTAGATTATCCGTGGCGATTC		72 °C	1 min		
			72 °C	10 min	1×	
<i>clbQ</i>	IHAPJPN55	821	94 °C	4.5 min	1×	Johnson et al., 2008
	TTATCCTGTTAGCTTTCGTTC		94 °C	0.5 min		
	IHAPJPN56		57 °C	0.5 min	30×	
	CTTGTATAGTTACACAACCTATTTC		72 °C	1 min		
			72 °C	10 min	1×	
<i>traJ</i>	PTraJ-1	210	94 °C	4.5 min	1×	Čitar, 2010
	TCCAAAAAATGATGATGAAT		94 °C	0.5 min		
	PTraJ-2		67 °C	0.5 min	30×	
	ATAGGAACCTCCTCACAAAG		72 °C	0.5 min		
			72 °C	10 min	1×	
<i>iss</i>	Iss1	793	95 °C	4.5 min	1×	Starčič Erjavec et al., 2011
	ACGATACTCCGTAGCCAGAGAT		94 °C	0.5 min		
	Iss2		68 °C	0.5 min	30×	
	ATGAACAGTGCAGATGAGCTCC		72 °C	1 min		
			72 °C	7 min	1×	
<i>traT</i>	traT1	288	95 °C	4.5 min	1×	Johnson & Stell, 2000
	GGTGTGGTGCGATGAGCACAG		94 °C	0.5 min		
	traT2		71 °C	0.5 min	30×	
	CACGGTTCAGCCATCCCTGAG		72 °C	0.5 min		
			72 °C	7 min	1×	

REFERENCES

- Cirl, C., Wieser, A., Yadav, M., Duerr, S., Schubert, S., Fischer, H., Stappert, D., Wantia, N., Rodriguez, N., Wagner, H., Svanborg, C. & Miethke, T. (2008). Subversion of Toll-like receptor signaling by a unique family of bacterial Toll/interleukin-1 receptor domain-containing proteins. *Nat Med* **14**, 399–406.
- Čitar, M. (2010). Virulentni dejavniki izolatov bakterije *Escherichia coli* iz blata zdravih ljudi. Biotehniška fakulteta, Ljubljana, pp. 97.
- Foxman, B., Zhang, L., Palin, K., Tallman, P. & Marrs, C. F. (1995). Bacterial virulence characteristics of *Escherichia coli* isolates from first-time urinary tract infection. *J Infect Dis* **171**, 1514–1521.
- Huang, S.-H., Wass, C., Fu, Q., Prasadarao, N.V., Stins, M. & Kim, K.S. (1995). *Escherichia coli* invasion of brain microvascular endothelial cells in vitro and in vivo: molecular cloning and characterization of invasion gene *ibe10*. *Infect Immun* **63**, 4470–4475.
- Johnson, J. R. & Brown, J. J. (1996). A novel multiply primed polymerase chain reaction assay for identification of variant papG genes encoding the Gal(alpha 1-4)Gal-binding PapG adhesins of *Escherichia coli*. *J Infect Dis* **173**, 920–926.
- Johnson, J. R. & Stell, A. (2000). Extended virulence genotypes of *Escherichia coli* strains from patients with urosepsis in relation to phylogeny and host compromise. *J Infect Dis* **181**, 261–272.
- Johnson, J. R., Russo, T.A., Tarr, P. I., Carlino, U., Bilge, S.S., Vary, J. C. Jr. & Stell, A. L. (2000). Molecular epidemiological and phylogenetic associations of two novel putative virulence genes, *iha* and *iron*_(E. coli), among *Escherichia coli* isolates from patients with urosepsis. *Infect Immun* **68**, 3040–3047.
- Johnson, J. R., Johnston, B., Kuskowski, M. A., Nougayrede, J. P. & Oswald, E. (2008). Molecular epidemiology and phylogenetic distribution of the *Escherichia coli* pks genomic island. *J Clin Microbiol* **46**, 3906–3911.
- Kuhar, I., Grabnar, M. & Žgur-Bertok, D. (1998). Virulence determinants of uropathogenic *Escherichia coli* in fecal strains from intestinal infections and healthy individuals. *FEMS Microbiol Lett* **164**, 243–248.
- Lau, S. H., Reddy, S., Cheesbrough, J., Bolton, F.J., Willshaw, G., Cheasty, T., Fox, A. J. & Upton, M. (2008). Major uropathogenic *Escherichia coli* strain isolated in the northwest of England identified by multilocus sequence typing. *J Clin Microbiol* **46**, 1076–1080.
- Le Bouguenec, C., Archambaud, M. & Labigne, A. (1992). Rapid and specific detection of the pap, afa, and sfa adhesin-encoding operons in uropathogenic *Escherichia coli* strains by polymerase chain reaction. *J Clin Microbiol* **30**, 1189–1193.
- Nowrouzian, F., Adlerberth, I. & Wold, A. E. (2001). P fimbriae, capsule and aerobactin characterize colonic resident *Escherichia coli*. *Epidemiol Infect* **126**, 11–18.
- Russo, T. A., Carlino, U. B. & Johnson, J. R. (2001). Identification of a new iron-regulated virulence gene, *ireA*, in an extraintestinal pathogenic isolate of *Escherichia coli*. *Infect Immun* **69**, 6209–6216.
- Schubert, S., Rakin, A., Karch, H., Carniel, E. & Heesemann, J. (1998). Prevalence of the "high-pathogenicity island" of Yersinia species among *Escherichia coli* strains that are pathogenic to humans. *Infect Immun* **66**, 480–485.
- Starčič Erjavec, M., Arbiter, T. & Žgur-Bertok, D. (2009). Pathogenicity islands, plasmids and iron uptake systems in extraintestinal pathogenic *Escherichia coli* strains. *Acta Biol Slov* **52**, 73–83.

- Starčič Erjavec, M., Palandačić, A., Žgur-Bertok, D. & Ambrožič Avguštin, J. (2011).** Genetic background of uropathogenic *Escherichia coli* isolates from Slovenia in relation to fluoroquinolone and sulfamethoxazole/trimethoprim resistance. *Acta Biol Slov* **54**, 5–13.
- Yamamoto, S., Terai, A., Yuri, K., Kurazono, H., Takeda, Y. & Yoshida, O. (1995).** Detection of urovirulence factors in *Escherichia coli* by multiplex polymerase chain reaction. *FEMS Immunol Med Microbiol* **12**, 85–90.
- Wirth, T., Falush, D., Lan, R., Colles, F., Mensa, P., Wieler, L. H., Karch, H., Reeves, P. R., Maiden, M. C., Ochman, H. & Achtman M. (2006).** Sex and virulence in *Escherichia coli*: an evolutionary perspective. *Mol Microbiol* **60**, 1136–1151.