Supplementary Materials

# A Case Study on Factors Influencing *Escherichia coli* Concentrations in an Urban River Draining a Fully Sewered Area


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**Figure S1.** Photograph of the sampling site at the Tsurumi River.

**Table S1.** Date of sampling, *E. coli* concentration, precipitation (rainfall), examined number of isolates for microbial susceptibility test.

| Date | *E.coli* (CFU/mL) | Precipitation (mm) | | | Number of isolates | |
|---|---|---|---|---|---|---|
| | | 0-24hr | 24-48hr | 48-72hr | Examined | CTX(R) |
| 2022/5/9 | 2.0 | 0 | 0 | 3.5 | 30 | 2 |
| 2022/5/28 | 2.5 | 15 | 8 | 0 | 20 | 3 |
| 2022/6/7 | 18.9 | 24 | 13.5 | 0 | 40 | 2 |
| 2022/6/28 | 5.5 | 0 | 0 | 0 | 0 | — |
| 2022/7/27 | 20.0 | 2 | 13.5 | 0 | 0 | — |
| 2022/9/5 | 3.0 | 0 | 0 | 23 | 0 | — |
| 2022/9/26 | 15.0 | 0 | 1 | 76 | 0 | — |
| 2022/10/4 | 4.0 | 0 | 0 | 0 | 0 | — |
| 2022/10/24 | 1.3 | 0 | 0 | 0 | 0 | — |
| 2022/11/8 | 3.2 | 0 | 0 | 0 | 0 | — |
| 2022/11/28 | 5.0 | 0 | 3 | 0.5 | 40 | 11 |
| 2022/12/8 | 28.5 | 0 | 0 | 37 | 0 | — |
| 2023/4/10 | 2.2 | 0 | 1.5 | 20.5 | 38 | 19 |
| 2023/4/24 | 1.4 | 0 | 0 | 0 | 35 | 3 |
| 2023/5/29 | 1.3 | 1 | 0 | 0 | 32 | 22 |
| 2023/6/19 | 2.3 | 0 | 0 | 0 | 33 | 10 |
| 2023/7/3 | 2.6 | 0 | 30.5 | 5.5 | 34 | 34 |
| 2023/7/24 | 1.1 | 0 | 0 | 0 | 36 | 36 |
| 2023/8/8 | 33.0 | 0 | 8 | 0 | 28 | 9 |
| 2023/9/12 | 3.7 | 0 | 0 | 13.5 | 33 | 8 |
| 2023/9/25 | 4.2 | 0 | 19 | 7.5 | 37 | 23 |
| 2023/10/24 | 1.2 | 0 | 0 | 0 | 33 | 2 |
| 2023/11/27 | 0.8 | 1.5 | 0.5 | 0 | 36 | 4 |
| 2023/12/5 | 1.0 | 0 | 0 | 0 | 40 | 9 |
| 2023/12/11 | 0.8 | 0 | 0 | 0 | 36 | 6 |
| 2023/12/12 | 37.7 | 24.5 | 0 | 0 | 0 | — |
| 2024/4/15 | 1.0 | 0 | 0 | 0 | 21 | 2 |
| 2024/5/13 | 145.0 | 33.5 | 0 | 0 | 16 | 2 |
| 2024/6/10 | 22.0 | 17 | 0 | 0 | 22 | 1 |
| 2024/7/17 | 43.2 | 40.5 | 0 | 3 | 12 | 4 |
| 2024/9/3 | 4.1 | 0.5 | 36.5 | 21 | 9 | 1 |
| 2024/9/25 | 6.5 | 0 | 0 | 13 | 8 | 3 |
| 2024/10/15 | 11.3 | 0 | 0 | 0 | 27 | 3 |
| 2024/11/4 | 11.7 | 0 | 51 | 7.5 | 18 | 2 |
| 2024/12/9 | 1.7 | 0 | 0 | 0 | 22 | 5 |

**Table S2.** Results of MLIT monitoring at Kamenoko bridge at the Tsurumi River. The original data were downloaded from Water Information System available online: http://www1.river.go.jp/ (accessed on 1 April 2025).

| Date | Time | pH | BOD (mg/L) | COD (mg/L) | SS (mg/L) | DO (mg/L) | TN (mg/L) | TP (mg/L) | *E. coli* (CFU/100mL) |
|---|---|---|---|---|---|---|---|---|---|
| 2022/11/9 | 6:18:00 | 7.4 | 2.0 | 6.5 | 1 | 7.3 | 9.1 | 0.33 | 130 |
| 2022/12/9 | 7:30:00 | 7.4 | 2.5 | 5.7 | 2 | 8.2 | 7.9 | 0.37 | 280 |
| 2023/1/11 | 6:35:00 | 7.3 | 4.9 | 7.1 | 2 | 8.4 | 11.0 | 0.32 | 570 |
| 2023/2/1 | 8:10:00 | 7.2 | 6.0 | 8.2 | 3 | 8.2 | 10.0 | 0.31 | 540 |
| 2023/3/2 | 9:12:00 | 7.3 | 4.4 | 7.6 | 7 | 8.2 | 9.0 | 0.34 | 660 |
| 2023/4/12 | 15:03:00 | 7.5 | 6.3 | 7.7 | 5 | 7.9 | 7.2 | 0.33 | 170 |
| 2023/5/10 | 13:40:00 | 7.5 | 2.7 | 5.5 | 6 | 8.2 | 5.2 | 0.42 | 240 |
| 2023/6/20 | 14:00:00 | 7.6 | 3.1 | 5.9 | 4 | 7.2 | 6.2 | 0.16 | 180 |
| 2023/7/5 | 14:10:00 | 7.5 | 3.3 | 6.6 | 4 | 7.0 | 6.0 | 0.23 | 240 |
| 2023/8/2 | 13:46:00 | 7.4 | 5.2 | 8.8 | 8 | 6.3 | 6.5 | 0.20 | 340 |
| 2023/9/6 | 15:14:00 | 7.5 | 3.3 | 7.5 | 6 | 6.2 | 6.6 | 0.39 | 240 |
| 2023/10/11 | 12:51:00 | 7.6 | 0.6 | 4.9 | 4 | 8.0 | 5.2 | 0.40 | 980 |
| 2023/11/1 | 13:31:00 | 7.5 | 1.9 | 6.7 | 3 | 7.8 | 7.7 | 0.35 | 220 |
| 2023/12/6 | 9:40:00 | 7.2 | 3.6 | 6.8 | 2 | 7.4 | 9.5 | 0.34 | 400 |
| 2024/1/10 | 12:53:00 | 7.2 | 4.6 | 7.1 | 3 | 8.0 | 10.0 | 0.41 | 360 |
| 2024/2/14 | 14:12:00 | 7.3 | 5.8 | 7.2 | 7 | 8.1 | 8.9 | 0.41 | 190 |
| 2024/3/15 | 15:47:00 | 7.5 | 3.3 | 6.4 | 5 | 8.9 | 6.0 | 0.32 | 280 |
| 2024/4/17 | 10:45:00 | 7.5 | 4.7 | 6.7 | 3 | 7.5 | 7.1 | 0.33 | 310 |
| 2024/5/8 | 12:35:00 | 7.6 | 5.1 | 7.0 | 5 | 7.1 | 7.6 | 0.33 | 510 |
| 2024/6/5 | 11:00:00 | 7.5 | 1.8 | 4.9 | 7 | 7.5 | 4.5 | 0.42 | 690 |
| 2024/7/3 | 11:40:00 | 7.6 | 1.6 | 4.7 | 3 | 6.3 | 5.4 | 0.33 | 370 |
| 2024/8/21 | 14:16:00 | 7.7 | 2.6 | 7.1 | 6 | 6.7 | 6.5 | 0.34 | 140 |
| 2024/9/11 | 10:21:00 | 7.5 | 1.4 | 5.7 | 3 | 7.0 | 6.4 | 0.28 | 580 |
| 2024/10/2 | 13:55:00 | 7.6 | 2.0 | 6.3 | 5 | 7.3 | 7.0 | 0.53 | 530 |
| 2024/11/6 | 14:50:00 | 7.4 | 1.9 | 5.8 | 3 | 7.8 | 6.7 | 0.28 | 550 |
| 2024/12/4 | 14:30:00 | 7.3 | 3.5 | 5.9 | 3 | 8.0 | 8.5 | 0.42 | 490 |

**Table S3.** Results on antimicrobial susceptibility test for isolates taken in 2024.

| Antimicrobial | ABPC | CEZ | CTX | GM | ST | TC | LVX |
|---|---|---|---|---|---|---|---|
| Resistant | 32 | 40 | 28 | 6 | 16 | 21 | 10 |
| Intermediate | 30 | 52 | 45 | 11 | 0 | 2 | 2 |
| Susceptible | 93 | 63 | 77 | 138 | 139 | 132 | 143 |
| Examined Total | 155 | 155 | 150 | 155 | 155 | 155 | 155 |

**Table S4.** Results of decay rates of native *E. coli* at the sampling location in the sample taken on 7 June 2022.

| Temperature | Overlying water | | | Sediment-containing water | | |
|---|---|---|---|---|---|---|
| | Day 0 | Day 3 | Day 7 | Day 0 | Day 3 | Day 7 |
| 4 °C | | 13.5 | 4.0 | | 175 | 170 |
| 20 °C | 23.5 | 2.0 | 0.1 | 220 | 65 | 27.5 |
| 37 °C | | 0 | 0.1 | | 10 | 0 |

**Table S5.** Results of decay rates of native *E. coli* at the sampling location in the sample taken on 28 June 2022.

| Temperature | Overlying water | | | Sediment-containing water | | |
|---|---|---|---|---|---|---|
| | Day 0 | Day 3 | Day 7 | Day 0 | Day 3 | Day 7 |
| 4 °C | | 4.3 | 2.2 | | 37 | 31.6 |
| 20 °C | 5.5 | 0.3 | 0.2 | 41 | 7.7 | 4.0 |
| 37 °C | | 0.1 | 0 | | 8.0 | 7.3 |