Supplementary Materials for

Epidemiology and characterization of CTX-M-55-type extended-spectrum β-lactamase–producing *Salmonella enterica* serovar Enteritidis isolated from patients in Shanghai, China

Chenyang Cao¹, Qinya Niu¹, Jia Chen², Xuebin Xu³, Huanjing Sheng¹, Shenghui Cui¹, Bin Liu¹ and Baowei Yang¹,*

¹ College of Food Science and Engineering, Northwest A&F University, Yangling 712100, China
² College of Chemical Technology, Shijiazhuang University, Shijiazhuang 050035, China
³ Shanghai Municipal Center for Disease Control & Prevention, Shanghai 200336, China
⁴ National Institutes for Food and Drug Control, Beijing 100050, China

*Correspondence: ybwsheng@nwafu.edu.cn; Tel.: +86-29-87092486; Fax: +86-29-87092486
**Table of Content**

**Figure S1** The number and detection rate of ESBL-producing *S. Enteritidis* (ESBL-SE) isolates recovered from different years (*n* = 292).

**Table S1** Primers used for the detection of β-lactamase genes among *Salmonella enterica* serovar *Enteritidis* isolates in this study.

**Table S2** The donor and recipient strains of ESBL-encoding gene used for conjugation experiment. Black squares denote the presence of resistance to a given antimicrobial agent.

**Table S3** Antibiotic resistance of *S. Enteritidis* isolates recovered from human patients in Shanghai, 2006–2014 (*n* = 292).

**Table S4** Distribution of the minimum inhibitory concentrations (MICs) of seven cephalosporins against ESBL-producing *S. Enteritidis* isolates (*n* = 233).

**Table S5** PFGE pattern, clinical background information, and antibiotic resistance of selected ESBL-producing *S. Enteritidis* isolates (*n* = 113).

**Table S6** Antibiotic resistance profiles of donor strains, recipient strains, and transconjugants, and the conjugation frequency of ESBL-encoding genes. Black squares denote the presence of resistance to a given antimicrobial agent.
Figure S1. The number and detection rate of ESBL-producing S. Enteritidis (ESBL-SE) isolates recovered from different years ($n = 292$).
Table S1 Primers used for the detection of β-lactamase genes among *Salmonella enterica* serovar Enteritidis isolates in this study.

| Gene  | Primer       | Sequence (5’–3’)                               | Product (bp) | Reference |
|-------|--------------|------------------------------------------------|--------------|-----------|
| blaCTX-M | *bla*CTX-M-F | GAGTTTCCCCCATTCGGTTTC                          | 880          | [1]       |
|       | *bla*CTX-M-R | CAGAATAAGGAATTCATGGTT                           |              |           |
| blaTEM | *bla*TEM-F   | ATGAGTATTCAACATTTCCG                           | 964          | [2]       |
|       | *bla*TEM-R   | ACCAATGCTTATCAGTGAG                            |              |           |
| blacMY | *bla*CMY-F   | GACAGCCTCTTTCTCCACA                           | 1000         | [3]       |
|       | *bla*CMY-R   | TGGGAACGAGGCTACGTA                            |              |           |
| blaACC | *bla*ACC-F   | AGCCCTCAGCAGCCGTTAC                           | 818          | [2]       |
|       | *bla*ACC-R   | GAAGCCGTAGTGATCCGG                            |              |           |
| blaSHV | *bla*SHV-F   | TTCGCTGTGTATTATCTCCCTG                        | 854          | [2]       |
|       | *bla*SHV-R   | TTAGCGTTGCCAGTGCTCG                           |              |           |
| blaveB | *bla*VEB-F   | GATAGGAGTACAGACATAG                           | 914          | [1]       |
|       | *bla*VEB-R   | TTTATTCAATTAGTAATTCACG                        |              |           |
| blaver | *bla*PER-F   | ATGAATGTCATCAAAAAATG                          | 927          | [1]       |
|       | *bla*PER-R   | TCAATCCGGACCTAC                              |              |           |
| blages | *bla*GES-F   | ATGCAGTCCATTACGCAC                            | 864          | [1]       |
|       | *bla*GES-R   | CTATTTGTCCGTGCACGAC                          |              |           |
| blapse | *bla*PSE-F   | AATGCGAATCAGCGCTCC                           | 598          | [3]       |
|       | *bla*PSE-R   | GGGGCTTGTACCATCACAC                          |              |           |
| bloatA | *bla*OXA-F   | ACCAGATTCAACTTCTAA                           | 590          | [4]       |
|       | *bla*OXA-R   | TCTTGGCGTTTATAGCTTG                         |              |           |
Table S2 The donor and recipient strains of ESBL-encoding gene used for conjugation experiment. Black squares denote the presence of resistance to a given antimicrobial agent.

| Strain | Organism        | Source  | Sample | PFGE Pattern | ESBL-encoding gene | AMP | AMC | CTX | CAZ | GEN | TET | CIP | NAL | SXT | CHL |
|--------|-----------------|---------|--------|--------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Donor  |                 |         |        |              |                    |     |     |     |     |     |     |     |     |     |     |     |
| 71     | *Salmonella* Enteritidis | Clinical | Feces  | A4           | 2011   *bla*$_{CTX-M-55}$/*bla*$_{TEM-1}$ |     |     |     |     |     |     |     |     |     |     |     |
| 86     | *Salmonella* Enteritidis | Clinical | Feces  | A35          | 2012   *bla*$_{CTX-M-55}$      |     |     |     |     |     |     |     |     |     |     |     |
| 122    | *Salmonella* Enteritidis | Clinical | Feces  | A19          | 2013   *bla*$_{CTX-M-55}$      |     |     |     |     |     |     |     |     |     |     |     |
| Recipient |                 |         |        |              |                    |     |     |     |     |     |     |     |     |     |     |     |
| 20     | *Salmonella* Enteritidis | Clinical | Feces  | 2009         | -                  |     |     |     |     |     |     |     |     |     |     |     |
| 1-22   | *Escherichia coli* | Food    | Chicken| 2016         | -                  |     |     |     |     |     |     |     |     |     |     |     |
| C600   | *Escherichia coli* |         |        |              |                    |     |     |     |     |     |     |     |     |     |     |     |

AMP: Ampicillin; AMC: Amoxicillin-Clavulanic acid; CTX: Cefotaxime; CAZ: Ceftazidime; GEN: Gentamicin; TET: Tetracycline; CIP: Ciprofloxacin; NAL: Nalidixic acid; SXT: Sulfamethoxazole/Trimethoprim; CHL: Chloramphenicol.
Table S3 Antibiotic resistance of *S. Enteritidis* isolates recovered from human patients in Shanghai, 2006–2014 (*n* = 292).

| Antibiotic                  | Total No. (%) (n = 292) | 2006–2010 (n = 28) | 2011 (n = 40) | 2012 (n = 48) | 2013 (n = 139) | 2014 (n = 37) |
|-----------------------------|-------------------------|-------------------|--------------|--------------|---------------|--------------|
| Cefotaxime                  | 284 (97.3)a             | 28 (100.0)a       | 32 (80.0)b   | 48 (100.0)a  | 139 (100.0)a  | 37 (100.0)a  |
| Ceftazidime                 | 251 (86.0)b             | 9 (32.1)c         | 5 (12.5)c    | 41 (85.4)b   | 130 (93.5)b   | 34 (91.9)a   |
| Ampicillin                  | 250 (85.6)b             | 24 (85.7)b        | 5 (12.5)c    | 47 (97.9)a   | 138 (99.3)a   | 37 (100.0)a  |
| Nalidixic acid              | 219 (75.0)c             | 28 (100.0)a       | 0 (0.0)d     | 47 (97.9)a   | 138 (99.3)a   | 37 (100.0)a  |
| Sulfoisoxazole              | 140 (48.0)f             | 21 (75.0)b        | 2 (5.0)d     | 28 (58.3)c   | 69 (49.6)c    | 20 (54.1)b   |
| Streptomycin                | 168 (57.5)d             | 19 (67.9)b        | 36 (90.0)b   | 28 (58.3)c   | 68 (48.9)c    | 17 (46.0)bc  |
| Tetracycline                | 130 (44.5)f             | 7 (25.0)c         | 29 (72.5)b   | 20 (41.7)c   | 65 (46.8)c    | 9 (24.3)c    |
| Chloramphenicol             | 79 (27.1)f              | 3 (10.7)c         | 0 (0.0)d     | 8 (16.7)d    | 60 (43.2)c    | 8 (21.6)c    |
| Sulfamethoxazole/Trimethoprim | 75 (25.7)f            | 7 (25.0)c         | 38 (95.0)a   | 4 (8.3)d     | 17 (12.2)d    | 9 (24.3)c    |
| Amoxicillin/Clavulanate     | 21 (7.2)b               | 5 (17.9)c         | 0 (0.0)d     | 5 (10.4)d    | 6 (4.3)e      | 5 (13.5)cde  |
| Ciprofloxacin               | 33 (11.3)b              | 21 (75.0)b        | 5 (12.5)c    | 0 (0.0)e     | 6 (4.3)c      | 1 (2.7)d     |
| Ofloxacin                   | 11 (3.8)f               | 3 (10.7)c         | 4 (10.0)c    | 0 (0.0)e     | 4 (2.9)e      | 0 (0.0)c     |
| Trimethoprim                | 51 (17.5)e              | 7 (25.0)c         | 29 (72.5)b   | 3 (6.3)de    | 4 (2.9)e      | 8 (21.6)c    |
| Gentamicin                  | 53 (18.6)e              | 10 (35.7)c        | 27 (67.5)b   | 6 (12.5)d    | 2 (1.4)c      | 8 (21.6)c    |

* In each column, the resistance rates of individual antibiotics sharing the same lowercase letters show no significant difference (*P* > 0.05).
Table S4 Distribution of the minimum inhibitory concentrations (MICs) of seven cephalosporins against ESBL-producing S. Enteritidis isolates \((n = 233)\).

| Cephalosporins | Breakpoint (μg/mL) | Distribution of MICs (μg/mL) | Resistance (%) |
|----------------|--------------------|------------------------------|----------------|
|                |                    | 128 (%) | 64 (%) | 32 (%) | 16 (%) | 4 (%) |                |
| Cefotaxime     | ≥ 4                | 202 (86.7) | 17 (7.3) | 5 (2.2) | 9 (3.9) | 233 (100.0) |
| Ceftazidime    | ≥ 16               | 8 (3.4) | 7 (3.0) | 67 (28.8) | 112 (48.1) | 194 (83.3) |
| Ceftriaxone    | ≥ 4                | 191 (82.0) | 25 (10.7) | 8 (3.4) | 161 (69.1) | 161 (69.1) |
| Cefepime       | ≥ 16               | 161 (69.1) | 224 (96.1) | 224 (96.1) |       |
| Cefazolin      | ≥ 8                | 224 (96.1) | 224 (96.1) |       |
| Cefpodoxime    | ≥ 8                | 224 (96.1) | 224 (96.1) |       |
| Cefoxitin      | ≥ 32               | 2 (0.9) | 1 (0.4) |       | 3 (1.3) |
Table S5 PFGE pattern, clinical background information, and antibiotic resistance of selected ESBL-producing *S. Enteritidis* isolates (*n* = 113).

| PFGE pattern | Strain | Year | District | Hospital | Hospital type       | Source            | Sample | Age^b^ | ESBL-encoding gene               |
|--------------|--------|------|----------|----------|---------------------|-------------------|--------|--------|----------------------------------|
| B1-1         | 137    | 2013 | C        | C2       | Public hospital      | Intestinal outpatient | Feces  | 58     | *bla*<sub>CTX-M-55</sub>/*bla*<sub>TEM-1</sub> |
| B1-1         | 138    | 2013 | C        | C5       | Community hospital   | Intestinal outpatient | Feces  | 10     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 139    | 2013 | C        | C2       | Public hospital      | Intestinal outpatient | Feces  | 9      | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 140    | 2013 | C        | C5       | Community hospital   | Intestinal outpatient | Feces  | 79     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 141    | 2013 | C        | C6       | Community hospital   | Intestinal outpatient | Feces  | 44     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 277    | 2014 | F        | F3       | Community hospital   | Intestinal outpatient | Feces  | 62     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 278    | 2014 | F        | F5       | Public hospital      | Intestinal outpatient | Feces  | 24     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 265    | 2014 | D        | D3       | Public hospital      | General outpatient   | Feces  | 25     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 268    | 2014 | A        | A5       | Public hospital      | Intestinal outpatient | Feces  | 43     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 270    | 2014 | I        | I1       | Public hospital      | Intestinal outpatient | Feces  | 47     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 271    | 2014 | H        | H2       | Public hospital      | Intestinal outpatient | Feces  | 66     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 250    | 2013 | F        | F5       | Public hospital      | Intestinal outpatient | Feces  | 21     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 253    | 2013 | F        | F4       | Public hospital      | Intestinal outpatient | Feces  | 31     | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 240    | 2013 | A        | A2       | Pediatric Hospital   | Other outpatient     | Feces  | 7      | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 241    | 2013 | A        | A2       | Pediatric Hospital   | Other outpatient     | Feces  | 8      | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 246    | 2013 | A        | A2       | Pediatric Hospital   | Other outpatient     | Feces  | 6      | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 196    | 2013 | A        | A2       | Pediatric Hospital   | General outpatient   | Feces  | 8      | *bla*<sub>CTX-M-55</sub>         |
| B1-1         | 193    | 2013 | A        | A2       | Pediatric Hospital   | General outpatient   | Feces  | 4      | *bla*<sub>CTX-M-55</sub>         |
| PFGE pattern | Strain | Year | District¹ | Hospital     | Hospital type        | Source          | Sample | Age²  | ESBL-encoding gene                  |
|-------------|--------|------|-----------|--------------|----------------------|-----------------|--------|-------|------------------------------------|
| B1-1        | 192    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient| Feces  | 3 Y   | blaCTX-M-55                        |
| B1-1        | 190    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient| Feces  | 1 Y   | blaCTX-M-55                        |
| B1-1        | 188    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient| Feces  | 2 Y   | blaCTX-M-55                        |
| B1-1        | 185    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient| Feces  | 1 Y   | blaCTX-M-55                        |
| B1-1        | 89     | 2012 | G         | G3 Community | Community hospital   | Intestinal outpatient | Feces  | 60 Y  | blaCTX-M-55/blaTEM-1               |
| B1-1        | 97     | 2012 | K         | K1 Public    | Public hospital      | Other            | Feces  | 60 Y  | blaCTX-M-55/blaTEM-1               |
| B1-1        | 233    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | General outpatient| Feces  | 8 M   | blaCTX-M-55                        |
| B1-1        | 234    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient | Feces  | 3 Y   | blaCTX-M-55                        |
| B1-1        | 237    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient | Feces  | 4 Y   | blaCTX-M-55                        |
| B1-1        | 223    | 2013 | B         | B1 Pediatric | Pediatric Hospital   | Intestinal outpatient | Feces  | 3 Y   | blaCTX-M-55                        |
| B1-1        | 216    | 2013 | B         | B2 Public    | Public hospital      | Intestinal outpatient | Feces  | 56 Y  | blaCTX-M-55                        |
| B1-1        | 217    | 2013 | B         | B2 Public    | Public hospital      | Intestinal outpatient | Feces  | 26 Y  | blaCTX-M-55                        |
| B1-1        | 218    | 2013 | B         | B2 Public    | Public hospital      | Intestinal outpatient | Feces  | 56 Y  | blaCTX-M-55                        |
| B1-1        | 206    | 2013 | B         | B1 Pediatric | Pediatric Hospital   | Intestinal outpatient | Feces  | 3 Y   | blaCTX-M-55                        |
| B1-1        | 208    | 2013 | B         | B1 Pediatric | Pediatric Hospital   | Intestinal outpatient | Feces  | 8 M   | blaCTX-M-55                        |
| B1-1        | 209    | 2013 | B         | B1 Pediatric | Pediatric Hospital   | Intestinal outpatient | Feces  | 3 Y   | blaCTX-M-55                        |
| B1-1        | 200    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other            | Feces  | 5 M   | blaCTX-M-55                        |
| B1-1        | 94     | 2012 | E         | E3 Other     | Other                | Other            | Feces  | 8 Y   | blaCTX-M-55                        |
| B1-1        | 95     | 2012 | E         | E1 Public    | Public hospital      | Intestinal outpatient | Feces  | 14 Y  | blaCTX-M-55                        |
| B1-1        | 106    | 2012 | A         | A2 Pediatric | Pediatric Hospital   | General outpatient | Feces  | 2 Y   | blaCTX-M-55                        |
| B1-1        | 183    | 2013 | A         | A2 Pediatric | Pediatric Hospital   | Other outpatient | Feces  | 1 Y   | blaCTX-M-55                        |
| PFGE pattern | Strain | Year | District | Hospital | Hospital type       | Source               | Sample | Age | ESBL-encoding gene |
|-------------|--------|------|----------|----------|---------------------|----------------------|--------|-----|------------------|
| B1-1        | 207    | 2013 | B        | B1       | Pediatric Hospital  | Intestinal outpatient| Feces  | 2 Y | blaCTX-M-55      |
| B1-1        | 212    | 2013 | B        | B2       | Public hospital     | Intestinal outpatient| Feces  | 25 Y| blaCTX-M-55      |
| B1-1        | 275    | 2014 | D        | D1       | Public hospital     | Intestinal outpatient| Feces  | 26 Y| blaCTX-M-55      |
| B1-2        | 274    | 2014 | A        | A2       | Pediatric Hospital  | Other                | Feces  | 1 Y | blaCTX-M-55      |
| B1-2        | 199    | 2013 | A        | A2       | Pediatric Hospital  | General outpatient   | Feces  | 4 Y | blaCTX-M-55      |
| B1-2        | 198    | 2013 | A        | A2       | Pediatric Hospital  | General outpatient   | Feces  | 2 Y | blaCTX-M-55      |
| B1-2        | 135    | 2013 | C        | C4       | Public hospital     | Intestinal outpatient| Feces  | 1 Y | blaCTX-M-55      |
| B1-2        | 107    | 2012 | A        | A2       | Pediatric Hospital  | General outpatient   | Feces  | 5 Y | blaCTX-M-55      |
| B1-2        | 220    | 2013 | B        | B1       | Pediatric Hospital  | Intestinal outpatient| Feces  | 3 Y | blaCTX-M-55      |
| B1-2        | 221    | 2013 | B        | B1       | Pediatric Hospital  | Intestinal outpatient| Feces  | 17 Y| blaCTX-M-55      |
| B1-2        | 222    | 2013 | B        | B1       | Pediatric Hospital  | Intestinal outpatient| Feces  | 17 Y| blaCTX-M-55      |
| B1-2        | 214    | 2013 | B        | B1       | Pediatric Hospital  | Intestinal outpatient| Feces  | 1 Y | blaCTX-M-55/blaTEM-1 |
| B1-2        | 215    | 2013 | B        | B2       | Public hospital     | Intestinal outpatient| Feces  | 50 Y| blaCTX-M-55      |
| B1-5        | 166    | 2013 | G        | G1       | Public hospital     | Intestinal outpatient| Feces  | 55 Y| blaCTX-M-55      |
| B1-5        | 108    | 2012 | A        | A2       | Pediatric Hospital  | General outpatient   | Feces  | 3 Y | blaCTX-M-55      |
| B1-5        | 279    | 2014 | J        | J2       | Public hospital     | Intestinal outpatient| Feces  | 34 Y| blaCTX-M-55      |
| B1-12       | 142    | 2013 | A        | A5       | Public hospital     | Intestinal outpatient| Feces  | 46 Y| blaCTX-M-55      |
| B1-12       | 296    | 2014 | G        | G3       | Community hospital  | Intestinal outpatient| Feces  | 26 Y| blaCTX-M-55      |
| PFGE pattern | Strain | Year | Districta | Hospital | Hospital type | Source | Sample | Ageb | ESBL-encoding gene |
|-------------|--------|------|-----------|----------|--------------|--------|--------|------|-------------------|
| B2-9        | 295    | 2014 | G         | G1       | Public hospital | Intestinal outpatient | Feces | 64 Y | **bla**<sub>CTX-M-55</sub> |
| B2-9        | 302    | 2014 | B         | B1       | Pediatric Hospital | Intestinal outpatient | Feces | 11 M | **bla**<sub>CTX-M-55</sub> |
| B2-9        | 290    | 2013 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 4 Y  | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 38     | 2011 | J         | J1       | Public hospital   | Intestinal outpatient | Feces | 27 Y | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 39     | 2011 | G         | G1       | Public hospital   | Intestinal outpatient | Feces | 23 Y | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 41     | 2011 | A         | A5       | Pediatric Hospital | Intestinal outpatient | Feces | 4 Y  | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 50     | 2011 | C         | C1       | Public hospital   | Intestinal outpatient | Feces | 2 Y  | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-214</sub> |
| B2-10       | 65     | 2011 | G         | G3       | Public hospital   | Intestinal outpatient | Feces | 59 Y | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 66     | 2012 | B         | B3       | Public hospital   | Intestinal outpatient | Feces | 58 Y | **bla**<sub>CTX-M-55</sub> |
| B2-10       | 76     | 2012 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 4 Y  | **bla**<sub>CTX-M-55</sub> |
| B2-10       | 79     | 2012 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 2 Y  | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-10       | 280    | 2014 | J         | J3       | Public hospital   | Intestinal outpatient | Feces | 34 Y | **bla**<sub>CTX-M-55</sub> |
| B2-11       | 87     | 2012 | B         | B1       | Pediatric Hospital | Intestinal outpatient | Feces | 17 D | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-11       | 88     | 2012 | B         | B1       | Pediatric Hospital | Intestinal outpatient | Feces | 2 Y  | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-11       | 91     | 2012 | F         | F3       | Community hospital | Intestinal outpatient | Feces | 54 Y | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-11       | 93     | 2012 | H         | H2       | Public hospital   | Intestinal outpatient | Feces | 49 Y | **bla**<sub>CTX-M-55</sub>/**bla**<sub>TEM-1</sub> |
| B2-11       | 168    | 2013 | D         | D1       | Public hospital   | Intestinal outpatient | Feces | 64 Y | **bla**<sub>CTX-M-55</sub> |
| B3-1        | 184    | 2013 | A         | A2       | Pediatric Hospital | Other outpatient | Feces | 1 Y  | **bla**<sub>CTX-M-55</sub> |
| PFGE pattern | Strain | Year | District | Hospital | Hospital type | Source | Sample | Age<sup>b</sup> | ESBL-encoding gene |
|-------------|--------|------|----------|----------|---------------|--------|--------|--------------|------------------|
| B3-1        | 124    | 2013 | C        | C3       | Public hospital | Intestinal outpatient | Feces | 55 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 125    | 2013 | C        | C4       | Public hospital | Intestinal outpatient | Feces | 17 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 126    | 2013 | A        | -        | Other          | Other | Feces | 45 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 151    | 2013 | B        | -        | Other          | Other | Feces | 33 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 148    | 2013 | B        | -        | Other          | Other | Feces | 21 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 150    | 2013 | B        | -        | Other          | Other | Feces | 24 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 152    | 2013 | B        | -        | Other          | Other | Feces | 23 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 153    | 2013 | B        | B2       | Public hospital | Intestinal outpatient | Feces | 30 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 154    | 2013 | B        | B2       | Public hospital | Intestinal outpatient | Feces | 27 Y          | bla<sub>CTX-M-55</sub>/bla<sub>TEM-1</sub> |
| B3-1        | 155    | 2013 | B        | B2       | Public hospital | Intestinal outpatient | Feces | 30 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 156    | 2013 | A        | A2       | Pediatric Hospital | Other outpatient | Feces | 2 Y           | bla<sub>CTX-M-55</sub> |
| B3-1        | 159    | 2013 | A        | A2       | Pediatric Hospital | Other outpatient | Feces | 1 Y           | bla<sub>CTX-M-55</sub> |
| B3-1        | 161    | 2013 | A        | A2       | Pediatric Hospital | Other outpatient | Feces | 1 Y           | bla<sub>CTX-M-55</sub> |
| B3-1        | 162    | 2013 | A        | A2       | Pediatric Hospital | Other outpatient | Feces | 11 M          | bla<sub>CTX-M-55</sub> |
| B3-1        | 163    | 2013 | A        | A2       | Pediatric Hospital | General outpatient | Feces | 2 Y           | bla<sub>CTX-M-55</sub> |
| B3-1        | 144    | 2013 | B        | -        | Other          | Other | Feces | 32 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 145    | 2013 | B        | -        | Other          | Other | Feces | 22 Y          | bla<sub>CTX-M-55</sub>/bla<sub>TEM-1</sub> |
| B3-1        | 146    | 2013 | B        | -        | Other          | Other | Feces | 27 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 147    | 2013 | B        | -        | Other          | Other | Feces | 34 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 167    | 2013 | D        | D2       | Public hospital | Intestinal outpatient | Feces | 81 Y          | bla<sub>CTX-M-55</sub> |
| B3-1        | 169    | 2013 | K        | K1       | Public hospital | Other outpatient | Feces | 22 Y          | bla<sub>CTX-M-55</sub> |
| PFGE pattern | Strain | Year | Districta | Hospital | Hospital type | Source | Sample | Ageb | ESBL-encoding gene |
|-------------|-------|------|-----------|----------|--------------|--------|-------|------|-------------------|
| B3-1        | 170   | 2013 | L         | L1       | Public hospital | Intestinal outpatient | Feces | 84 Y | bla$_{CTX-M-55}$   |
| B3-1        | 172   | 2013 | E         | E1       | Public hospital | Other outpatient | Feces | 72 Y | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B3-1        | 173   | 2013 | E         | E1       | Public hospital | Intestinal outpatient | Feces | 76 Y | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B3-1        | 293   | 2014 | J         | J2       | Public hospital | Intestinal outpatient | Feces | 65 Y | bla$_{CTX-M-55}$   |
| B3-1        | 294   | 2014 | G         | G1       | Public hospital | Intestinal outpatient | Feces | 62 Y | bla$_{CTX-M-55}$   |
| B3-1        | 281   | 2014 | F         | F3       | Community hospital | Intestinal outpatient | Feces | 72 Y | bla$_{CTX-M-55}$   |
| B3-1        | 291   | 2013 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 1 Y  | bla$_{CTX-M-55}$   |
| B3-1        | 195   | 2013 | A         | A2       | Pediatric Hospital | General outpatient | Feces | 8 M  | bla$_{CTX-M-55}$   |
| B3-2        | 84    | 2012 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 3 Y  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B3-2        | 69    | 2011 | A         | A2       | Pediatric Hospital | Other | Feces | 4 Y  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B3-2        | 122   | 2013 | A         | A1       | Public hospital | Intestinal outpatient | Feces | 46 Y | bla$_{CTX-M-55}$   |
| B4-1        | 273   | 2014 | A         | A2       | Pediatric Hospital | Other outpatient | Feces | 7 M  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B4-1        | 244   | 2013 | A         | A2       | Pediatric Hospital | Other outpatient | Feces | 1 Y  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B4-1        | 225   | 2013 | B         | B1       | Pediatric Hospital | Intestinal outpatient | Feces | 2 Y  | bla$_{CTX-M-55}$   |
| B4-1        | 114   | 2012 | B         | B3       | Public hospital | Other | Blood | 19 Y | bla$_{CTX-M-55}$   |
| B5-2        | 100   | 2012 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 4 M  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |
| B5-2        | 104   | 2012 | A         | A2       | Pediatric Hospital | Intestinal outpatient | Feces | 1 Y  | bla$_{CTX-M-55}$/bla$_{TEM-1}$ |

a The district code is shown in Figure 1.
b Y: Year; M: Month; D: Day.
| Strain | Designation | Antimicrobial resistance | Conjugation frequency | ESBL-encoding gene |
|--------|-------------|--------------------------|-----------------------|-------------------|
| 71     | Donor       | AMP AMC CTX CAZ GEN TET CIP NAL SXT CHL | 6.2x10^-1 | blaCTX-M-55/blaTEM-1 |
| 20     | Recipient   |                          |                       |                   |
| 71-20  | Transconjugant |                        |                       |                   |
| 1-22   | Recipient   |                          |                       |                   |
| 71-1-22| Transconjugant |                        | 3.3x10^-4 | blaCTX-M-55/blaTEM-1 |
| C600   | Recipient   |                          | 1.5x10^-2 | blaCTX-M-55/blaTEM-1 |
| 71-C600| Transconjugant |                        |                       |                   |
| 86     | Donor       | AMP AMC CTX CAZ GEN TET CIP NAL SXT CHL | 4.6x10^-2 | blaCTX-M-55 |
| 86-20  | Transconjugant |                        |                       |                   |
| 86-1-22| Transconjugant |                        | 1.2x10^-2 | blaCTX-M-55 |
| 86-C600| Transconjugant |                        | 4.2x10^-2 | blaCTX-M-55 |
| 122    | Donor       | AMP AMC CTX CAZ GEN TET CIP NAL SXT CHL | 9.1x10^-2 | blaCTX-M-55 |
| 122-20 | Transconjugant |                        |                       |                   |
| 122-1-22| Transconjugant |                        | 1.1x10^-4 | blaCTX-M-55 |
| 122-C600| Transconjugant |                        | 1.9x10^-2 | blaCTX-M-55 |

AMP: Ampicillin; AMC: Amoxicillin-Clavulanic acid; CTX: Cefotaxime; CAZ: Ceftazidine; GEN: Gentamicin; TET: Tetracycline;
CIP: Ciprofloxacin; NAL : Nalidixic acid; SXT: Sulfamethoxazole/Trimethoprim; CHL: Chloramphenicol.
References

1. Kiratisin, P.; Apisarnthanarak, A.; Laesripa, C.; Saifon, P. Molecular characterization and epidemiology of extended-spectrum-beta-lactamase-producing Escherichia coli and Klebsiella pneumoniae isolates causing health care-associated infection in Thailand, where the CTX-M family is endemic. *Antimicrob Agents Chemother* **2008**, *52*, 2818-2824, doi:10.1128/AAC.00171-08.

2. Archambault, M.; Petrov, P.; Hendriksen, R.S.; Asseva, G.; Bangtrakulnonth, A.; Hasman, H.; Aarestrup, F.M. Molecular characterization and occurrence of extended-spectrum beta-lactamase resistance genes among Salmonella enterica serovar Corvallis from Thailand, Bulgaria, and Denmark. *Microb Drug Resist* **2006**, *12*, 192-198, doi:10.1089/mdr.2006.12.192.

3. Qiao, J.; Alali, W.Q.; Liu, J.; Wang, Y.; Chen, S.; Cui, S.; Yang, B. Prevalence of Virulence Genes in Extended-Spectrum beta-lactamases (ESBLs)-Producing Salmonella in Retail Raw Chicken in China. *J Food Sci* **2018**, *83*, 1048-1052, doi:10.1111/1750-3841.14111.

4. Usha, G.; Chunderika, M.; Prashini, M.; Willem, S.A.; Yusuf, E.S. Characterization of extended-spectrum beta-lactamases in Salmonella spp. at a tertiary hospital in Durban, South Africa. *Diagn Microbiol Infect Dis* **2008**, *62*, 86-91, doi:10.1016/j.diagmicrobio.2008.04.014.