**Supplementary Information**

**Virulence Profiles of *Vibrio vulnificus* in German Coastal Waters, a Comparison of North Sea and Baltic Sea Isolates**

| Geographical Region | Sampling Site No. | Sampling Site     | No. of Strains | Classification (Coastal Waters) | Bathing Water Quality |
|---------------------|-------------------|------------------|----------------|---------------------------------|-----------------------|
| **North Sea**       | 1                 | Borkum           | 1              | euhaline open coastal waters    | excellent             |
|                     | 2                 | Dyksterhusen     | 3              | mesohaline inner coastal waters | good                  |
|                     | 3                 | Jemgum           | 1              | mesohaline inner coastal waters | no designated beach   |
|                     | 4                 | Burhave          | 8              | mesohaline inner coastal waters | excellent             |
|                     | 5                 | Dedesdorf        | 9              | mesohaline inner coastal waters | no designated beach   |
|                     | 6                 | Kleinensiel      | 2              | mesohaline inner coastal waters | no designated beach   |
|                     | 7                 | Bremerhaven      | 16             | mesohaline inner coastal waters | no designated beach   |
|                     | 8                 | Wremen           | 5              | mesohaline inner coastal waters | excellent             |
|                     | 9                 | Altenbruch       | 3              | mesohaline inner coastal waters | excellent             |
|                     |                   | k.A.             | 2              |                                  |                       |
| **Baltic Sea**      | 10                | Mönkeberg        | 1              | mesohaline inner coastal waters | Excellent             |
|                     | 11                | Kiel-Dietrichsdorf| 1             | mesohaline inner coastal waters | no designated beach   |
|                     | 12                | Wohlenberger Wiek| 2              | mesohaline inner coastal waters | good                  |
|                     | 13                | Kühlungsborn     | 1              | mesohaline inner coastal waters | excellent             |
|                     | 14                | Warnemünde       | 6              | mesohaline open coastal waters  | excellent             |
|                     | 15                | Darss-Zingster Bodden chain, station 9 | 2 | mesohaline inner coastal waters | no designated beach   |
|                     | 16                | Darss-Zingster Bodden chain, station 8 | 2 | mesohaline inner coastal waters | no designated beach   |
|                     | 17                | Darss-Zingster Bodden chain, station 7 | 4 | mesohaline inner coastal waters | no designated beach   |
|                     | 18                | Greifswalder Bodden, station 5 | 2 | mesohaline inner coastal waters | no designated beach   |
|                     | 19                | Greifswalder Bodden, station 4 | 3 | mesohaline inner coastal waters | no designated beach   |
|                     | 20                | Greifswalder Bodden, station 3 | 5 | mesohaline inner coastal waters | no designated beach   |
### Table S1. Cont.

| Geographical Region | Sampling Site No. | Sampling Site | No. of Strains | Classification (Coastal Waters) | Bathing Water Quality |
|---------------------|-------------------|---------------|----------------|---------------------------------|-----------------------|
| Baltic Sea          | 21                | Greifswalder Bodden, station 2 | 4              | mesohaline inner coastal waters | no designated beach   |
|                     | 22                | Lubmin        | 4              | mesohaline inner coastal waters | excellent            |
|                     | 23                | Karlshagen    | 3              | mesohaline open coastal waters  | excellent            |
|                     | 24                | Trassenheide  | 1              | mesohaline open coastal waters  | excellent            |
|                     | 25                | Greifswalder Bodden, station 1 | 2              | mesohaline inner coastal waters | no designated beach   |
|                     | 26                | Binz          | 7              | mesohaline open coastal waters  | excellent            |
|                     | 27                | Rügen         | 1              | mesohaline inner coastal waters | no designated beach   |

\(^\text{a}\) according to the European Water Framework Directive 2000/60/EC. \(^\text{b}\) according to the requirements of the European Bathing Water Directive 2006/7/EC; results from 2011.

### Table S2. Detailed sampling information of *V. vulnificus* isolates examined in this study.

| Strain ID | Origin | Sampling Site No. | Sampling Site Name | Seawater Temperature (°C) | Seawater Salinity (psu) | Sampling Date  |
|-----------|--------|-------------------|--------------------|--------------------------|------------------------|---------------|
| VN-0279   | B-sw   | 12                | Wohlenberger Wiek  | 15.5                     | 13                     | 06.09.2011    |
| VN-2813   | N-sw   | -                 | n.s.               | n.s.                     | n.s.                   | 16.05.2011    |
| VN-2814   | N-sw   | -                 | n.s.               | n.s.                     | n.s.                   | 16.05.2011    |
| VN-2961   | B-sw   | 11                | Kiel-Dietrichsdorf | 18                       | n.s.                   | 25.07.2011    |
| VN-2969   | B-sw   | 10                | Mönkeberg          | 17.4                     | n.s.                   | 25.07.2011    |
| VN-3363   | N-sd   | 4                 | Burhave            | 25.6                     | 21.7                   | 12.07.2010    |
| VN-3364   | N-sd   | 4                 | Burhave            | 25.6                     | 21.7                   | 12.07.2010    |
| VN-3366   | N-sd   | 4                 | Burhave            | 25.6                     | 21.7                   | 12.07.2010    |
| VN-3367   | N-sd   | 7                 | Bremerhaven        | 24.8                     | 17.0                   | 12.07.2010    |
| VN-3368   | N-sd   | 7                 | Bremerhaven        | 24.8                     | 17.0                   | 12.07.2010    |
| VN-3369   | N-sd   | 7                 | Bremerhaven        | 24.8                     | 17.0                   | 12.07.2010    |
| VN-3373   | N-sd   | 5                 | Dedesdorf          | 20.4                     | 8.2                    | 12.07.2010    |
| VN-3374   | N-sd   | 5                 | Dedesdorf          | 20.4                     | 8.2                    | 12.07.2010    |
| VN-3378   | N-sw   | 2                 | Dyksterhusen        | 20.4                     | 20.5                   | 20.07.2010    |
| Strain ID | Origin | Sampling Site No. | Sampling Site Name | Seawater Temperature (°C) | Seawater Salinity (psu) | Sampling Date |
|----------|--------|-------------------|-------------------|---------------------------|--------------------------|---------------|
| VN-3379  | N-sw   | 2                 | Dyksterhusen       | 20.4                      | 20.5                     | 20.07.2010    |
| VN-3394  | N-sd   | 8                 | Wremen             | 21.7                      | 22.5                     | 10.08.2010    |
| VN-3398  | N-sw   | 8                 | Wremen             | 21.7                      | 22.5                     | 10.08.2010    |
| VN-3403  | N-sw   | 8                 | Wremen             | 21.7                      | 22.5                     | 10.08.2010    |
| VN-3408  | N-sw   | 2                 | Dyksterhusen       | 19                        | 14.2                     | 17.08.2010    |
| VN-3410  | N-sw   | 4                 | Burchave           | 18.7                      | 25.1                     | 18.08.2010    |
| VN-3411  | N-sd   | 4                 | Burchave           | 18.7                      | 25.1                     | 18.08.2010    |
| VN-3412  | N-sw   | 7                 | Bremerhaven        | 20.5                      | 19.3                     | 18.08.2010    |
| VN-3415  | N-sw   | 7                 | Bremerhaven        | 20.5                      | 19.3                     | 18.08.2010    |
| VN-3418  | N-sd   | 7                 | Bremerhaven        | 20.5                      | 19.3                     | 18.08.2010    |
| VN-3419  | N-sw   | 5                 | Dedesdorf          | 20.7                      | 6.2                      | 18.08.2010    |
| VN-3426  | N-sd   | 5                 | Dedesdorf          | 20.7                      | 6.2                      | 18.08.2010    |
| VN-3442  | N-sd   | 1                 | Borkum             | 16                        | 29.8                     | 24.08.2010    |
| VN-3443  | N-sd   | 4                 | Burchave           | 15                        | 11.8                     | 07.09.2010    |
| VN-3444  | N-sd   | 4                 | Burchave           | 15                        | 11.8                     | 07.09.2010    |
| VN-3446  | N-sd   | 7                 | Bremerhaven        | 15                        | 11.8                     | 07.09.2010    |
| VN-3448  | N-sw   | 7                 | Bremerhaven        | 17.5                      | 14.6                     | 07.09.2010    |
| VN-3451  | N-sw   | 7                 | Bremerhaven        | 17.5                      | 14.6                     | 07.09.2010    |
| VN-3454  | N-sd   | 7                 | Bremerhaven        | 17.5                      | 14.6                     | 07.09.2010    |
| VN-3457  | N-sd   | 7                 | Bremerhaven        | 17.5                      | 14.6                     | 07.09.2010    |
| VN-3461  | N-sw   | 5                 | Dedesdorf          | 17.7                      | 1.9                      | 07.09.2010    |
| VN-3465  | N-sd   | 5                 | Dedesdorf          | 17.7                      | 1.9                      | 07.09.2010    |
| VN-3467  | N-sd   | 5                 | Dedesdorf          | 17.7                      | 1.9                      | 07.09.2010    |
| VN-3477  | N-sw   | 7                 | Bremerhaven        | 14.1                      | 14.9                     | 05.10.2010    |
| VN-3478  | N-sd   | 7                 | Bremerhaven        | 14.1                      | 14.9                     | 05.10.2010    |
| VN-3479  | N-sd   | 5                 | Dedesdorf          | 15.6                      | 5.3                      | 05.10.2010    |
| Strain ID | Origin | Sampling Site No. | Sampling Site Name | Seawater Temperature (°C) | Seawater Salinity (psu) | Sampling Date |
|-----------|--------|------------------|-------------------|--------------------------|-------------------------|---------------|
| VN-3494   | N-sw   | 7                | Bremerhaven       | 17.5                     | 14.6                    | 07.09.2010    |
| VN-3496   | N-sw   | 7                | Bremerhaven       | 17.5                     | 14.6                    | 07.09.2010    |
| VN-3498   | N-sd   | 4                | Burhave           | 15                       | 11.8                    | 07.09.2010    |
| VN-3500   | N-sd   | 7                | Bremerhaven       | 20.5                     | 12.4                    | 11.07.2011    |
| VN-3506   | N-sw   | 5                | Dedesdorf         | 17.7                     | 1.9                     | 07.09.2010    |
| VN-3518   | N-sw   | 9                | Altenbruch        | n.s.                     | n.s.                    | 12.06.2012    |
| VN-3529   | N-sw   | 6                | Kleinensiel       | n.s.                     | n.s.                    | 02.08.2012    |
| VN-3533   | N-sw   | 8                | Wremen            | n.s.                     | n.s.                    | 07.08.2012    |
| VN-3536   | N-sw   | 9                | Altenbruch        | n.s.                     | n.s.                    | 07.08.2012    |
| VN-3538   | N-sw   | 6                | Kleinensiel       | n.s.                     | n.s.                    | 13.08.2012    |
| VN-3539   | N-sw   | 3                | Jemgum            | n.s.                     | n.s.                    | 14.08.2012    |
| VN-3541   | N-sw   | 8                | Wremen            | n.s.                     | n.s.                    | 21.08.2012    |
| VN-3542   | N-sw   | 9                | Altenbruch        | n.s.                     | n.s.                    | 06.09.2012    |
| VN-3904   | B-sd   | 19               | Greifswalder Bodden, station 4 | 19.0       | 6.6                     | 05.07.2011    |
| VN-3905   | B-sd   | 19               | Greifswalder Bodden, station 4 | 19.0       | 6.6                     | 05.07.2011    |
| VN-3906   | B-sd   | 18               | Greifswalder Bodden, station 5 | 19.3       | 7.2                     | 05.07.2011    |
| VN-3909   | B-sd   | 17               | Bodden chain, station 7 | 19.2       | 7.9                     | 05.07.2011    |
| VN-3910   | B-sd   | 17               | Bodden chain, station 7 | 19.2       | 7.9                     | 05.07.2011    |
| VN-3912   | B-sd   | 16               | Bodden chain, station 8 | 19.0       | 7.1                     | 05.07.2011    |
| Code     | Format | Depth | Location                        | Temperature | Salinity | Date       |
|----------|--------|-------|---------------------------------|-------------|----------|------------|
| VN-3914  | B-sd   | 15    | Darss-Zingster Bodden chain, station 9 | 18.4        | 7.3      | 05.07.2011 |
| VN-3915  | B-sd   | 15    | Darss-Zingster Bodden chain, station 9 | 18.4        | 7.3      | 05.07.2011 |
| VN-3919  | B-sd   | 25    | Greifswalder Bodden, station 1    | 18.4        | 6.7      | 06.07.2011 |
| VN-3921  | B-sd   | 21    | Greifswalder Bodden, station 2    | 18.9        | 6.6      | 06.07.2011 |
| VN-3922  | B-sw   | 20    | Greifswalder Bodden, station 3    | 19.1        | 6.4      | 06.07.2011 |
| VN-3924  | B-sd   | 20    | Greifswalder Bodden, station 3    | 19.1        | 6.4      | 06.07.2011 |
| VN-3925  | B-sd   | 12    | Wohlenberger Wick                | 18.9        | 10.7     | 01.08.2011 |
Table S2. *Cont.*

| Strain ID | Origin | Sampling Site No. | Sampling Site Name                        | Seawater Temperature (°C) | Seawater Salinity (psu) | Sampling Date     |
|-----------|--------|-------------------|------------------------------------------|---------------------------|-------------------------|-------------------|
| VN-3926   | B-sd   | 25                | Greifswalder Bodden, station 1            | 18.2                      | 7.3                     | 02.08.2011        |
| VN-3927   | B-sd   | 21                | Greifswalder Bodden, station 2            | 19.5                      | 6.2                     | 02.08.2011        |
| VN-3928   | B-sw   | 20                | Greifswalder Bodden, station 3            | 18.9                      | 6.2                     | 02.08.2011        |
| VN-3929   | B-sd   | 20                | Greifswalder Bodden, station 3            | 18.9                      | 5.9                     | 02.08.2011        |
| VN-3931   | B-sd   | 20                | Greifswalder Bodden, station 3            | 18.9                      | 5.9                     | 02.08.2011        |
| VN-3932   | B-sd   | 19                | Greifswalder Bodden, station 4            | 19.7                      | 6.3                     | 02.08.2011        |
| VN-3934   | B-sd   | 17                | Darss-Zingster Bodden chain, station 7    | 19.7                      | 5.6                     | 03.08.2011        |
| VN-3935   | B-sd   | 16                | Darss-Zingster Bodden chain, station 7    | 19.7                      | 5.6                     | 03.08.2011        |
| VN-3937   | B-sd   | 16                | Darss-Zingster Bodden chain, station 8    | 20.7                      | 3                      | 03.08.2011        |
| VN-3946   | B-sd   | 21                | Greifswalder Bodden, station 2            | 13.4                      | 6.7                     | 11.10.2011        |
| VN-3947   | B-sd   | 21                | Greifswalder Bodden, station 2            | 13.4                      | 6.7                     | 11.10.2011        |
| VN-3948   | B-sd   | 18                | Greifswalder Bodden, station 5            | 12.6                      | 7.6                     | 11.10.2011        |
| VN-3959   | B-sw   | 22                | Lubmin                                    | 26                        | 6.5                     | 05.07.2010        |
| VN-3960   | B-sw   | 23                | Karshagen                                  | 21.1                      | 5.4                     | 19.07.2010        |
| VN-3961   | B-sw   | 23                | Karshagen                                  | 21.1                      | 5.4                     | 19.07.2010        |
| VN-3962   | B-sw   | 22                | Lubmin                                    | 20                        | 6.4                     | 19.07.2010        |
| VN-3964   | B-sw   | 26                | Binz                                      | n.s.                      | 6.7                     | 23.07.2010        |
| VN-3965   | B-sw   | 26                | Binz                                      | n.s.                      | 6.7                     | 23.07.2010        |
| VN-3966   | B-sw   | 26                | Binz                                      | n.s.                      | 6.7                     | 23.07.2010        |
| VN-3968   | B-sw   | 26                | Binz                                      | n.s.                      | 6.7                     | 23.07.2010        |
| VN-3969   | B-sw   | 26                | Binz                                      | n.s.                      | 6.7                     | 23.07.2010        |
| VN-3970   | B-sw   | 22                | Lubmin                                    | n.s.                      | 6.3                     | 02.08.2010        |
| VN-3971   | B-sw   | 24                | Trassenheide                               | 20.9                      | 6.6                     | 02.08.2010        |
| VN-3972   | B-sw   | 23                | Karshagen                                  | 21.5                      | 6.5                     | 02.08.2010        |
| VN-3973   | B-sw   | 13                | Kühlungsborn                               | 20.2                      | 8.3                     | 02.08.2010        |
Table S2. Cont.

| Strain ID | Origin | Sampling Site No. | Sampling Site Name | Seawater Temperature (°C) | Seawater Salinity (psu) | Sampling Date |
|-----------|--------|-------------------|--------------------|---------------------------|-------------------------|---------------|
| VN-3974   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3975   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3976   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3977   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3978   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3979   | B-sw   | 14                | Warnemünde         | 22.8                      | 8                       | 04.08.2010    |
| VN-3980   | B-sw   | 26                | Binz               | 21                        | 6.6                     | 09.08.2010    |
| VN-3981   | B-sw   | 22                | Lubmin             | 5.4                       | 19.5                    | 11.07.2011    |
| VN-3982   | B-sw   | 26                | Binz               | n.s.                      | 6.7                     | 23.07.2010    |
| VN-5163   | B-sw   | 27                | Rügen              | n.s.                      | n.s.                    | 12.06.2011    |

N, North Sea; B, Baltic Sea; sw, seawater; sd, sediment; n.s., not specified. * Sampling site numbers shown in Figure 1.

Table S3. Allelic profiles of the 101 *V. vulnificus* isolates tested (new STs/alleles are displayed in red).

| Strain ID | MLST ST | MLST-Cluster | Clonal Complex (SLV-Level) | Clonal Complex (TLV-Level) | glp | gyrB | mdh | metG | purM | dtdS | lysA | pntA | pyrC | tnaA |
|-----------|---------|--------------|----------------------------|----------------------------|-----|------|-----|------|------|------|------|------|------|------|------|
| VN-0279   | 217     | IIB          | Singleton                  | Singleton                  | 12  | 39   | 42  | 57   | 27   | 41   | 77   | 13   | 11   |
| VN-2813   | 219     | I            | Singleton                  | Singleton                  | 70  | 57   | 2   | 9    | 8    | 97   | 4    | 6    | 78   | 73   |
| VN-2814   | 219     | I            | Singleton                  | Singleton                  | 70  | 57   | 2   | 9    | 8    | 97   | 4    | 6    | 78   | 73   |
| VN-2961   | 220     | IIB          | Singleton                  | Singleton                  | 4   | 58   | 12  | 13   | 12   | 24   | 92   | 1    | 13   | 19   |
| VN-2969   | 220     | IIB          | Singleton                  | Singleton                  | 4   | 58   | 12  | 13   | 12   | 24   | 92   | 1    | 13   | 19   |
| VN-3363   | 223     | I            | Singleton                  | Singleton                  | 49  | 40   | 44  | 24   | 8    | 107  | 6    | 65   | 5    | 50   |
| VN-3364   | 223     | I            | Singleton                  | Singleton                  | 49  | 40   | 44  | 24   | 8    | 107  | 6    | 65   | 5    | 50   |
| VN-3366   | 224     | I            | Singleton                  | Singleton                  | 47  | 14   | 2   | 7    | 8    | 19   | 33   | 15   | 5    | 74   |
| VN-3367   | 219     | I            | Singleton                  | Singleton                  | 70  | 57   | 2   | 9    | 8    | 97   | 4    | 6    | 78   | 73   |
| VN-3368   | 225     | IIA          | Singleton                  | Singleton                  | 44  | 1    | 37  | 59   | 25   | 98   | 106  | 1    | 23   | 7    |
| VN-3369   | 225     | IIA          | Singleton                  | Singleton                  | 44  | 1    | 37  | 59   | 25   | 98   | 106  | 1    | 23   | 7    |
| Strain ID | MLST ST | MLST-Cluster | Clonal Complex (SLV-Level) | Clonal Complex (TLV-Level) | glp | gyrB | mdh | metG | purM | dtdS | lysA | pntA | pyrC | tnaA |
|-----------|---------|--------------|--------------------------|--------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| VN-3373   | 227     | I            | Singleton                | Singleton                | 7   | 23  | 22  | 2   | 8   | 22  | 4   | 66  | 56  | 18  |
| VN-3374   | 228     | I            | Singleton                | Singleton                | 71  | 12  | 41  | 8   | 22  | 69  | 67  | 56  | 73  |
| VN-3378   | 229     | I            | 1                        | Singleton                | 19  | 61  | 73  | 60  | 65  | 100 | 96  | 80  | 12  | 76  |
| VN-3379   | 171     | IIA          | Singleton                | Singleton                | 55  | 1   | 4   | 5   | 30  | 66  | 42  | 10  | 37  | 53  |
| VN-3394   | 230     | I            | Singleton                | Singleton                | 72  | 60  | 2   | 24  | 9   | 22  | 12  | 13  | 84  | 18  |
| VN-3398   | 231     | I            | Singleton                | Singleton                | 19  | 42  | 13  | 12  | 8   | 22  | 12  | 13  | 84  | 18  |
| VN-3403   | 230     | I            | Singleton                | Singleton                | 72  | 60  | 2   | 24  | 9   | 22  | 12  | 13  | 84  | 18  |
| VN-3408   | 232     | I            | Singleton                | Singleton                | 24  | 23  | 70  | 12  | 9   | 35  | 68  | 80  | 30  |
| VN-3410   | 233     | I            | 1                        | 2                         | 19  | 61  | 62  | 60  | 65  | 100 | 96  | 80  | 11  | 76  |
| VN-3411   | 234     | I            | Singleton                | Singleton                | 19  | 42  | 13  | 62  | 40  | 82  | 12  | 13  | 64  | 15  |
| VN-3412   | 235     | I            | Singleton                | Singleton                | 7   | 11  | 22  | 59  | 94  | 65  | 69  | 12  | 51  |
| VN-3415   | 236     | I            | Singleton                | Singleton                | 8   | 62  | 2   | 13  | 19  | 75  | 5   | 9   | 18  |
| VN-3418   | 237     | I            | Singleton                | Singleton                | 73  | 15  | 7   | 9   | 35  | 91  | 13  | 33  | 9   |
| VN-3419   | 238     | I            | Singleton                | Singleton                | 9   | 23  | 11  | 24  | 8   | 96  | 56  | 11  | 12  | 9   |
| VN-3426   | 239     | I            | 4                        | Singleton                | 74  | 11  | 2   | 22  | 60  | 103 | 12  | 20  | 81  | 50  |
| VN-3442   | 239     | I            | 4                        | 2                         | 74  | 61  | 62  | 60  | 65  | 100 | 96  | 80  | 11  | 76  |
| VN-3443   | 240     | I            | 1                        | 2                         | 19  | 61  | 73  | 60  | 65  | 100 | 96  | 80  | 11  | 76  |
| VN-3444   | 241     | IIA          | Singleton                | Singleton                | 35  | 63  | 25  | 25  | 105 | 114 | 36  | 43  | 77  |
| VN-3446   | 242     | I            | Singleton                | Singleton                | 75  | 42  | 12  | 9   | 22  | 12  | 70  | 82  | 78  |
| VN-3448   | 250     | I            | Singleton                | Singleton                | 26  | 2   | 3   | 62  | 110 | 12  | 20  | 84  | 83  |
| VN-3451   | 243     | I            | Singleton                | Singleton                | 76  | 64  | 60  | 8   | 106 | 98  | 13  | 83  | 79  |
| VN-3454   | 244     | I            | Singleton                | Singleton                | 10  | 28  | 7   | 8   | 107 | 76  | 71  | 15  | 80  | 79  |
| VN-3457   | 234     | I            | Singleton                | 19  | 42  | 13  | 62  | 40  | 82  | 12  | 13  | 64  | 15  |
| VN-3461   | 244     | I            | Singleton                | 10  | 28  | 13  | 7   | 8   | 107 | 26  | 71  | 15  | 80  |
| VN-3465   | 245     | I            | Singleton                | 47  | 14  | 17  | 18  | 8   | 44  | 18  | 21  | 4   | 9   |
| VN-3467   | 246     | I            | Singleton                | 18  | 19  | 17  | 17  | 8   | 5   | 95  | 21  | 4   | 26  |
| Strain ID | MLST ST | MLST-Cluster | Clonal Complex (SLV-Level) | Clonal Complex (TLV-Level) | glp | gyrB | mdh | metG | purM | dtdS | lysA | pntA | pyrC | tnaA |
|----------|---------|--------------|----------------------------|----------------------------|-----|------|-----|------|------|------|------|------|------|------|------|------|
| VN-3477  | 247     | I            | Singleton                  | Singleton                   | 71  | 23   | 2   | 12   | 61   | 22   | 113  | 7    | 26   | 62   |
| VN-3478  | 248     | IIA          | Singleton                  | Singleton                   | 77  | 65   | 71  | 63   | 23   | 108  | 41   | 72   | 59   | 81   |
| VN-3479  | 244     | I            | Singleton                  | Singleton                   | 10  | 28   | 13  | 7    | 8    | 107  | 26   | 71   | 15   | 80   |
| VN-3494  | 249     | I            | Singleton                  | Singleton                   | 71  | 66   | 44  | 64   | 59   | 109  | 100  | 69   | 11   | 82   |
| VN-3496  | 250     | I            | Singleton                  | Singleton                   | 26  | 2    | 2   | 3    | 62   | 110  | 12   | 20   | 84   | 83   |
| VN-3498  | 240     | I            | Singleton                  | Singleton                   | 19  | 61   | 73  | 60   | 65   | 100  | 96   | 80   | 11   | 76   |
| VN-3500  | 252     | I            | Singleton                  | Singleton                   | 78  | 67   | 2   | 22   | 9    | 22   | 12   | 73   | 26   | 10   |
| VN-3506  | 253     | I            | Singleton                  | Singleton                   | 52  | 28   | 11  | 23   | 8    | 34   | 60   | 21   | 5    | 52   |
| VN-3518  | 254     | I            | Singleton                  | Singleton                   | 79  | 16   | 75  | 2    | 9    | 111  | 17   | 18   | 85   | 45   |
| VN-3529  | 255     | I            | Singleton                  | Singleton                   | 80  | 23   | 9   | 12   | 63   | 111  | 64   | 74   | 9    | 84   |
| VN-3533  | 255     | I            | Singleton                  | Singleton                   | 80  | 23   | 9   | 12   | 63   | 111  | 64   | 74   | 9    | 84   |
| VN-3536  | 256     | I            | Singleton                  | Singleton                   | 81  | 43   | 9   | 12   | 63   | 22   | 93   | 74   | 86   | 85   |
| VN-3538  | 110     | IIA          | Singleton                  | Singleton                   | 38  | 1    | 12  | 31   | 27   | 23   | 36   | 1    | 48   | 47   |
| VN-3539  | 257     | I            | Singleton                  | Singleton                   | 13  | 14   | 15  | 40   | 9    | 40   | 6    | 25   | 5    | 4    |
| VN-3541  | 258     | I            | Singleton                  | Singleton                   | 74  | 26   | 2   | 22   | 60   | 103  | 12   | 75   | 81   | 18   |
| VN-3542  | 259     | I            | Singleton                  | Singleton                   | 68  | 73   | 2   | 22   | 65   | 112  | 112  | 25   | 11   | 18   |
| VN-3904  | 133     | I            | 6                          | 3                            | 13  | 14   | 15  | 7    | 34   | 6    | 15   | 14   | 14   |
| VN-3905  | 287     | I            | 2                          | 5                            | 47  | 14   | 11  | 61   | 8    | 64   | 53   | 23   | 17   | 41   |
| VN-3906  | 260     | I            | Singleton                  | Singleton                   | 82  | 2    | 20  | 2    | 8    | 107  | 110  | 71   | 87   | 86   |
| VN-3909  | 261     | I            | Singleton                  | Singleton                   | 47  | 12   | 74  | 22   | 8    | 2    | 6    | 76   | 50   | 87   |
| VN-3910  | 262     | IIB          | Singleton                  | Singleton                   | 12  | 39   | 14  | 42   | 25   | 24   | 92   | 41   | 13   | 11   |
| VN-3912  | 263     | IIB          | Singleton                  | Singleton                   | 6   | 4    | 13  | 14   | 7    | 25   | 27   | 61   | 77   | 13   | 11   |
| VN-3914  | 113     | I            | 4                          | 7                            | 50  | 8    | 10  | 7    | 9    | 22   | 33   | 9    | 5    | 30   |
| VN-3915  | 264     | I            | Singleton                  | Singleton                   | 69  | 14   | 11  | 7    | 9    | 113  | 105  | 78   | 88   | 39   |
| VN-3919  | 265     | I            | Singleton                  | Singleton                   | 1   | 8    | 41  | 10   | 3    | 9    | 114  | 33   | 15   | 49   | 44   |
| VN-3921  | 266     | I            | Singleton                  | Singleton                   | 84  | 38   | 11  | 23   | 9    | 34   | 110  | 5    | 17   | 49   |
| Strain ID | MLST ST | MLST-Cluster | Clonal Complex (SLV-Level) | Clonal Complex (TLV-Level) | glp | gyrB | mdh | metG | purM | dtdS | lysA | pntA | pyrC | tnaA |
|-----------|---------|--------------|---------------------------|---------------------------|-----|------|-----|------|------|------|------|------|------|------|------|------|
| VN-3922   | 226     | IIB          | Singleton                 | Singleton                 | 4   | 13   | 42  | 42   | 23   | 67   | 103  | 13   | 13   | 11   |
| VN-3924   | 268     | I            | Singleton                 |                            | 3   | 13   | 14  | 15   | 7    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3925   | 217     | IIB          | Singleton                 | Singleton                 | 12  | 39   | 42  | 29   | 57   | 27   | 41   | 77   | 13   | 11   |
| VN-3926   | 251     | I            | 2                         | Singleton                 | 5   | 47   | 14  | 11   | 61   | 8    | 99   | 53   | 23   | 17   | 41   |
| VN-3927   | 269     | I            | Singleton                 |                            | 1   | 8    | 8   | 10   | 3    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3928   | 268     | I            | Singleton                 |                            | 3   | 13   | 14  | 15   | 7    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3929   | 268     | I            | Singleton                 |                            | 3   | 13   | 14  | 15   | 7    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3931   | 270     | I            | Singleton                 |                            | 1   | 8    | 40  | 10   | 3    | 9    | 22   | 33   | 15   | 14   | 45   |
| VN-3932   | 271     | I            | Singleton                 | Singleton                 | 47  | 41   | 11  | 23   | 8    | 64   | 59   | 5    | 5    | 49   |
| VN-3933   | 226     | IIB          | Singleton                 | Singleton                 | 4   | 13   | 42  | 42   | 23   | 67   | 103  | 13   | 13   | 11   |
| VN-3934   | 272     | IIB          | 3                         | Singleton                 | 4   | 13   | 14  | 15   | 7    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3935   | 144     | I            | Singleton                 | Singleton                 | 47  | 14   | 2   | 7    | 41   | 19   | 17   | 46   | 15   | 15   | 44   |
| VN-3936   | 273     | I            | 5                         | Singleton                 | 8   | 8    | 10  | 3    | 9    | 115  | 41   | 15   | 15   | 44   |
| VN-3947   | 274     | I            | Singleton                 | Singleton                 | 85  | 40   | 2   | 65   | 13   | 81   | 1    | 46   | 5    | 44   |
| VN-3948   | 226     | IIB          | Singleton                 | Singleton                 | 4   | 13   | 42  | 42   | 23   | 67   | 103  | 13   | 13   | 11   |
| VN-3959   | 275     | I            | Singleton                 | Singleton                 | 18  | 14   | 11  | 2    | 3    | 116  | 62   | 5    | 53   | 25   |
| VN-3960   | 126     | I            | Singleton                 |                            | 1   | 8    | 8   | 10   | 3    | 9    | 22   | 55   | 15   | 49   | 44   |
| VN-3961   | 133     | I            | 6                         | Singleton                 | 3   | 13   | 14  | 15   | 7    | 9    | 34   | 6    | 15   | 14   | 44   |
| VN-3962   | 269     | I            | Singleton                 |                            | 1   | 8    | 8   | 10   | 3    | 9    | 115  | 17   | 15   | 49   | 44   |
| VN-3964   | 128     | IIB          | Singleton                 | Singleton                 | 12  | 13   | 14  | 13   | 12   | 4    | 41   | 1    | 13   | 11   |
| VN-3965   | 113     | I            | 4                         | Singleton                 | 7   | 50   | 8   | 10   | 7    | 9    | 22   | 33   | 9    | 5    | 30   |
| VN-3966   | 276     | I            | 4                         | Singleton                 | 7   | 86   | 8   | 10   | 7    | 9    | 22   | 33   | 9    | 5    | 30   |
| VN-3968   | 128     | IIB          | Singleton                 | Singleton                 | 12  | 13   | 14  | 13   | 12   | 4    | 41   | 1    | 13   | 11   |
| VN-3969   | 132     | I            | Singleton                 |                            | 8   | 49   | 40  | 44   | 7    | 8    | 22   | 57   | 15   | 5    | 50   |
| VN-3970   | 277     | I            | Singleton                 |                            | 8   | 49   | 40  | 44   | 2    | 8    | 22   | 57   | 5    | 5    | 50   |
| VN-3971   | 278     | I            | Singleton                 | Singleton                 | 87  | 42   | 11  | 7    | 8    | 82   | 57   | 65   | 5    | 45   |
Table S3. Cont.

| Strain ID | MLST ST | MLST-Cluster | Clonal Complex (SLV-Level) | Clonal Complex (TLV-Level) | glp | gyrB | mdh | metG | purM | dtdS | lysA | pntA | pyrC | tnaA |
|-----------|---------|--------------|----------------------------|---------------------------|-----|------|-----|------|------|------|------|------|------|------|------|
| VN-3972   | 277     | I            | Singleton                  | Singleton                  | 49  | 40   | 44  | 2    | 8    | 22   | 58   | 5    | 5    | 50   |
| VN-3973   | 268     | I            | Singleton                  | 3                          | 13  | 14   | 15  | 7    | 9    | 5    | 6    | 15   | 14   | 45   |
| VN-3974   | 279     | I            | Singleton                  | Singleton                  | 47  | 69   | 46  | 7    | 3    | 107  | 108  | 79   | 5    | 88   |
| VN-3975   | 280     | I            | 5                          | Singleton                  | 1   | 8    | 8   | 10   | 66   | 9    | 115  | 41   | 15   | 15   | 44   |
| VN-3976   | 281     | IIB          | Singleton                  | Singleton                  | 4   | 13   | 14  | 29   | 43   | 24   | 109  | 32   | 13   | 11   |
| VN-3977   | 281     | IIB          | Singleton                  | Singleton                  | 4   | 13   | 14  | 29   | 43   | 24   | 109  | 32   | 13   | 11   |
| VN-3978   | 282     | I            | Singleton                  | Singleton                  | 52  | 42   | 2   | 7    | 8    | 35   | 4    | 5    | 4    | 4    |
| VN-3979   | 128     | IIB          | Singleton                  | Singleton                  | 12  | 13   | 14  | 13   | 12   | 4    | 41   | 1    | 13   | 11   |
| VN-3980   | 269     | I            | Singleton                  | 1                          | 8   | 8    | 10  | 3    | 9    | 115  | 17   | 15   | 15   | 49   | 44   |
| VN-3981   | 283     | I            | Singleton                  | Singleton                  | 45  | 2    | 20  | 2    | 8    | 60   | 26   | 20   | 17   | 43   |
| VN-3982   | 284     | I            | 6                          | 3                          | 13  | 14   | 15  | 7    | 9    | 34   | 6    | 15   | 14   | 39   |
| VN-5163   | 65      | I            | 7                          | 9                          | 13  | 14   | 15  | 7    | 9    | 40   | 6    | 25   | 5    | 4    |

MLST, multilocus sequence typing; ST, sequence type; SLV, single locus variant; TLV, triple locus variant.
Table S4. Primers and probes used for PCR amplification and sequencing.

| Primer Name | Specificity/Gene Target/Designation | Sequence (5’ to 3’) | Amplicon (bp) | T_a (ºC) | Reference |
|-------------|-----------------------------------|---------------------|--------------|---------|-----------|
| SerE-F      | specific for serovar E           | TGTTGTTCTTGCCCACTTC | 665         | 64      | [1]       |
| SerE-R      | specific for serovar E           | CGCGCTTAGATTTGTCTCAC | [1]         |         |           |
| Bt2-F       | specific for biotype 2            | AGAGATGGAAAGAAACAGGCG | 344         | [1]     |           |
| Bt2-R       | specific for biotype 2            | GGACAGATAAAGGGCAATGG | [1]         |         |           |
| vvHA-F      | V. vulnificus-specific hemolysin | CGCCACCCACTTTGGGCGCC | 519         | [1]     |           |
| vvHA-R      | V. vulnificus-specific hemolysin | CGCGGTACACGGTGGCGCG | [1]         |         |           |
| UtoxF       |                                   | GASTTTGTGTTGCGGGAACGGAAC | 435         | 60      | [2]       |
| VvtoxR      | V. vulnificus-specific toxR       | AAGCGGAACGAAGACTCCGAC | [2]         |         |           |
| vcg-typeC-F | virulence correlated gene clinical allele | AGCTGGCGATAGCGATCT | 277      | 56      | [3]       |
| vcg-typeE-F | virulence correlated gene environmental allele | CTCAATTGACAATGATCT | 47       |         | [3]       |
| vcg-typeC/E-R | virulence correlated gene           | CGCTTAGGATGATCGGTG     | [2]         |         |           |
| VVA1612F    | Region XII, 5’flanking region     | ACCCTGATCGTGGGCTATCT | 2.257     | 65      | [4]       |
| VVA1613R    | Region XII, chondroitinase AC lyase | GGAGCGGTGATGATCGGTG    | [4]         |         |           |
| VVA1634F    | Region XII, arylsulfatase A       | TGGACCGCAACCTAGACAC    | 1.364     | 55      | [4]       |
| VVA1634R    | Region XII, arylsulfatase A       | ATGATGCCAAGCTGAGAGAAGAAGCTGAGATGATCGGTG    | [4]         |         |           |
| VVA1612bF   | Region XII, 5’flanking region     | TGGAGAGCGCAACAGAATGAC | 1.200     | 65      | [4]       |
| VVA1637R    | Region XII, 3’flanking region     | AACATCAACCAACGAGATCGAGATGATCGGTG    | [4]         |         |           |
| VVA1633a_F  | Region XII                        | CGTATCATCAGCATGTAAGAAGC | 2483      | 60      | this study|
| VVA1635c_R  | Region XII                        | GGTTCATCGTCCCCAAATGG | this study |         |           |
| VVA1633b_F  | Region XII                        | TCGAGATTGCAAACGCCGACC | this study |         |           |
| VVA1635a_R  | Region XII                        | CGGCGTAGAGAATGATAACG | this study |         |           |
| VVA1635b_R  | Region XII                        | CTGACATCATCAGACACAGTTC | this study | |           |
| VVA1634a_F  | Region XII, arylsulfatase A       | GGCACGGTCCAGAATTGG    | this study |         |           |
| VVA1634a_R  | Region XII, arylsulfatase A       | TGATCGAAACGTGCCATAGCC | this study |         |           |
| VVA1634b_F  | Region XII, arylsulfatase A       | TCTATTCGGCAACGTTGAC | this study |         |           |
| VVA1634b_R  | Region XII, arylsulfatase A       | GCAAGAATCATCGGGCATCTTTG | this study |         |           |
| Primer Name | Specificity/Gene Target/Designation | Sequence (5′ to 3′) | Amplicon (bp) | T_a (°C) | Reference |
|-------------|------------------------------------|---------------------|--------------|----------|-----------|
| VVA1634c_F | Region XII, arylsulfatase A        | CCCCTATCAAAACCAACAAC | this study   |
| VVA1634d_F | Region XII, arylsulfatase A        | GCTGCTTTACCGATGTGCTC | this study   |
| Vvu16S51-F | 16S rRNA gene                      | CAAGTCGAGCGGCAGCA   | 171          | 62       | [5]       |
| Vvu16S221-R| 16S rRNA gene                      | TCCTGACGCGAGAGGCC   |              |          | [5]       |
| Vvu16SA-P  | 16S rRNA gene type A allele        | 6-FAM-TGATAGCTTCGGCTCAAT-MGBNFQ | probe      |          | [5]       |
| Vvu16SB-P  | 16S rRNA gene type B allele        | VIC-CCCGTAGGCATATGC-MGBNFQ | probe      |          | [5]       |
| nanA-F     | sialic acid catabolism (SAC) cluster, aldolase, | TKATCGCCGCTCCYCATACA | 745         | 58       | [6]       |
| nanA-R     | sialic acid catabolism (SAC) cluster, aldolase, | GCAACGCGCCACCTATTCAAC |          |          | [7]       |
| Man IIA F  | mannitol fermentation operon, enzyme IIA | GATGTTGGTGAACAACCTTCTGC | 243         | 61       | [8]       |
| Man IIA R  | mannitol fermentation operon, enzyme IIA | TCTGAGCCTGTTGGATGCC |          |          | [8]       |

T_a, annealing temperature. a used for gene sequencing; b used for Real-Time PCR.
Table S5. Genotypic and phenotypic characteristics of *V. vulnificus* strains from the Baltic Sea and North Sea.

| Strain ID | Source | Sampling Site No. | BT | Serum Resistance | Mannitol Fermentation | 16S rRNA Type | vcg Type | Region XII | nanA | MLST ST | MLST Cluster | Risk Group |
|-----------|--------|------------------|----|------------------|----------------------|---------------|----------|------------|------|---------|-------------|------------|
| VN-0279   | B-sw   | 12               | 1  | R                | −                    | AB            | E        | +          | +    | 217     | IIB         | 2          |
| VN-2813   | N-sw   | –                | 1  | R                | +                    | A             | E        | −          | +    | 219     | I           | 2          |
| VN-2814   | N-sw   | –                | 1  | R                | +                    | A             | E        | −          | +    | 219     | I           | 2          |
| VN-2961   | B-sw   | 11               | 1  | R                | +                    | B             | E        | +          | −    | 220     | IIB         | 2          |
| VN-2969   | B-sw   | 10               | 1  | R                | +                    | AB            | E        | +          | −    | 220     | IIB         | 2          |
| VN-3363   | N-sd   | 4                | 1  | R                | +                    | A             | E        | +          | −    | 223     | I           | 2          |
| VN-3364   | N-sd   | 4                | 1  | R                | +                    | A             | E        | +          | −    | 223     | I           | 2          |
| VN-3366   | N-sd   | 4                | 1  | R                | −                    | A             | E        | −          | −    | 224     | I           | 1          |
| VN-3367   | N-sw   | 7                | 1  | R                | +                    | A             | E        | −          | +    | 219     | I           | 2          |
| VN-3368   | N-sw   | 7                | 1  | I                | +                    | B             | E        | −          | +    | 225     | IIA         | 2          |
| VN-3369   | N-sw   | 7                | 1  | R                | +                    | B             | C        | −          | +    | 225     | IIA         | 2          |
| VN-3373   | N-sd   | 5                | 1  | R                | −                    | A             | E        | −          | −    | 227     | I           | 1          |
| VN-3374   | N-sd   | 5                | 1  | R                | +                    | A             | E        | −          | +    | 228     | I           | 2          |
| VN-3378   | N-sw   | 2                | 1  | R                | −                    | A             | E        | −          | +    | 229     | I           | 2          |
| VN-3379   | N-sw   | 2                | 1  | R                | +                    | B             | C        | +          | +    | 171     | IIA         | 2          |
| VN-3394   | N-sd   | 8                | 1  | R                | +                    | A             | E        | +          | +    | 230     | I           | 2          |
| VN-3398   | N-sw   | 8                | 1  | R                | +                    | A             | E        | +          | +    | 231     | I           | 2          |
| VN-3403   | N-sw   | 8                | 1  | R                | +                    | A             | E        | +          | +    | 230     | I           | 2          |
| VN-3408   | N-sw   | 2                | 1  | R                | +                    | A             | E        | +          | +    | 232     | I           | 2          |
| VN-3410   | N-sw   | 4                | 1  | R                | −                    | A             | E        | −          | +    | 233     | I           | 2          |
| VN-3411   | N-sd   | 4                | 1  | I                | +                    | A             | E        | −          | +    | 234     | I           | 2          |
| VN-3412   | N-sw   | 7                | 1  | R                | +                    | A             | E        | −          | +    | 235     | I           | 2          |
| VN-3415   | N-sw   | 7                | 1  | R                | −                    | A             | E        | −          | +    | 236     | I           | 2          |
| Strain ID | Source | Sampling Site No. | BT | Serum Resistance | Mannitol Fermentation | 16S rRNA Type | vcg Type | Region XII | nanA | MLST-Cluster | Risk Group |
|----------|--------|-------------------|----|------------------|----------------------|---------------|-----------|------------|------|--------------|------------|
| VN-3418  | N-sd   | 7                 | 1  | R                | +                    | A             | E         | +          | +    | 237          | I          | 2          |
| VN-3419  | N-sw   | 5                 | 1  | R                | +                    | A             | E         | −          | +    | 238          | I          | 2          |
| VN-3426  | N-sd   | 5                 | 1  | R                | +                    | A             | E         | +          | +    | 239          | I          | 2          |
| VN-3442  | N-sd   | 1                 | 1  | R                | +                    | A             | E         | +          | +    | 239          | I          | 2          |
| VN-3443  | N-sd   | 4                 | 1  | R                | −                    | A             | E         | −          | +    | 240          | I          | 2          |
| VN-3444  | N-sd   | 4                 | 1  | R                | +                    | B             | C         | +          | −    | 241          | IIA        | 2          |
| VN-3446  | N-sd   | 7                 | 1  | I                | +                    | A             | E         | −          | +    | 242          | I          | 2          |
| VN-3448  | N-sw   | 7                 | 1  | R                | +                    | A             | E         | +          | +    | 250          | I          | 2          |
| VN-3451  | N-sw   | 7                 | 1  | I                | −                    | A             | E         | −          | −    | 243          | I          | 1          |
| VN-3454  | N-sd   | 7                 | 1  | S                | −                    | A             | E         | −          | −    | 244          | I          | 1          |
| VN-3457  | N-sd   | 7                 | 1  | R                | +                    | A             | E         | −          | +    | 234          | I          | 2          |
| VN-3461  | N-sw   | 5                 | 1  | S                | −                    | A             | E         | −          | −    | 244          | I          | 1          |
| VN-3465  | N-sd   | 5                 | 1  | R                | −                    | A             | E         | −          | −    | 245          | I          | 1          |
| VN-3467  | N-sd   | 5                 | 1  | R                | −                    | A             | E         | −          | −    | 246          | I          | 1          |
| VN-3477  | N-sw   | 7                 | 1  | I                | +                    | A             | E         | +          | +    | 247          | I          | 2          |
| VN-3478  | N-sd   | 7                 | 1  | R                | +                    | B             | C         | −          | +    | 248          | IIA        | 2          |
| VN-3479  | N-sd   | 5                 | 1  | S                | −                    | A             | E         | −          | −    | 244          | I          | 1          |
| VN-3494  | N-sw   | 7                 | 1  | R                | +                    | A             | E         | +          | +    | 249          | I          | 2          |
| VN-3496  | N-sw   | 7                 | 1  | R                | +                    | A             | E         | −          | +    | 250          | I          | 2          |
| VN-3498  | N-sd   | 4                 | 1  | R                | −                    | A             | E         | −          | +    | 240          | I          | 2          |
| VN-3500  | N-sd   | 7                 | 1  | R                | +                    | A             | E         | +          | +    | 252          | I          | 2          |
| VN-3506  | N-sw   | 5                 | 1  | R                | −                    | A             | E         | −          | +    | 253          | I          | 2          |
| VN-3518  | N-sw   | 9                 | 1  | R                | −                    | A             | E         | −          | −    | 254          | I          | 1          |
| Strain ID | Source | Sampling Site No. | BT | Serum Resistance | Mannitol Fermentation | 16S rRNA Type | vcg Type | Region XII | nanA | MLST -ST | MLST Cluster | Risk Group |
|-----------|--------|------------------|----|-----------------|----------------------|---------------|----------|-----------|------|----------|-------------|------------|
| VN-3529   | N-sw   | 6                | 1  | R               | +                    | A             | E        | +         | +    | 255      | I            | 2          |
| VN-3533   | N-sw   | 8                | 1  | R               | +                    | A             | E        | −         | +    | 255      | I            | 2          |
| VN-3536   | N-sw   | 9                | 1  | R               | +                    | A             | E        | +         | +    | 256      | I            | 2          |
| VN-3538   | N-sw   | 6                | 1  | R               | +                    | B             | E        | +         | +    | 110      | IIA          | 2          |
| VN-3539   | N-sw   | 3                | 1  | S               | −                    | A             | E        | −         | −    | 257      | I            | 1          |
| VN-3541   | N-sw   | 8                | 1  | R               | +                    | A             | E        | +         | +    | 258      | I            | 2          |
| VN-3542   | N-sw   | 9                | 1  | R               | −                    | A             | E        | −         | −    | 259      | I            | 1          |
| VN-3904   | B-sd   | 20               | 1  | R               | −                    | A             | E        | −         | −    | 287      | I            | 1          |
| VN-3905   | B-sd   | 20               | 1  | I               | −                    | A             | E        | −         | −    | 260      | I            | 1          |
| VN-3906   | B-sd   | 19               | 1  | R               | −                    | A             | E        | −         | −    | 261      | I            | 1          |
| VN-3909   | B-sd   | 18               | 1  | R               | −                    | A             | E        | −         | −    | 262      | IIB          | 2          |
| VN-3910   | B-sd   | 18               | 1  | R               | −                    | AB            | E        | +         | +    | 263      | IIB          | 2          |
| VN-3912   | B-sd   | 17               | 1  | R               | −                    | AB            | E        | +         | −    | 113      | I            | 1          |
| VN-3914   | B-sd   | 16               | 1  | I               | −                    | A             | E        | −         | −    | 264      | I            | 1          |
| VN-3915   | B-sd   | 16               | 1  | R               | −                    | A             | E        | −         | −    | 265      | I            | 1          |
| VN-3919   | B-sd   | 26               | 1  | I               | −                    | A             | E        | −         | −    | 266      | I            | 1          |
| VN-3921   | B-sd   | 22               | 1  | I               | −                    | A             | E        | −         | −    | 226      | IIB          | 2          |
| VN-3922   | B-sd   | 21               | 1  | R               | −                    | AB            | E        | +         | +    | 217      | IIB          | 2          |
| VN-3924   | B-sd   | 21               | 1  | R               | −                    | A             | E        | −         | −    | 251      | I            | 1          |
| VN-3925   | B-sd   | 13               | 1  | R               | −                    | AB            | E        | +         | +    | 269      | I            | 1          |
| VN-3926   | B-sd   | 26               | 1  | R               | −                    | A             | E        | −         | −    | 268      | I            | 1          |
| VN-3927   | B-sd   | 22               | 1  | I               | −                    | A             | E        | −         | −    | 269      | I            | 1          |
| VN-3928   | B-sw   | 21               | 1  | R               | −                    | A             | E        | −         | −    | 268      | I            | 1          |
| Strain ID | Source | Sampling Site No. | BT | Serum Resistance | Mannitol Fermentation | 16S rRNA Type | vcg Type | Region XII | nanA | MLST-ST | MLST Cluster | Risk Group |
|-----------|--------|------------------|----|------------------|-----------------------|--------------|----------|------------|------|---------|-------------|------------|
| VN-3929   | B-sd   | 21               | 1  | R                | −                     | A            | E        | −          | −    | 268     | I           | 1          |
| VN-3931   | B-sd   | 21               | 1  | R                | −                     | A            | E        | −          | −    | 270     | I           | 1          |
| VN-3932   | B-sd   | 20               | 1  | R                | −                     | A            | E        | −          | −    | 271     | I           | 1          |
| VN-3934   | B-sd   | 18               | 1  | R                | −                     | AB           | E        | +          | +    | 226     | IIB          | 2          |
| VN-3935   | B-sd   | 17               | 1  | R                | −                     | AB           | E        | +          | −    | 272     | IIB          | 2          |
| VN-3937   | B-sd   | 17               | 1  | R                | −                     | A            | E        | −          | −    | 144     | I           | 1          |
| VN-3946   | B-sd   | 22               | 1  | I                | −                     | A            | E        | −          | −    | 273     | I           | 1          |
| VN-3947   | B-sd   | 22               | 1  | R                | −                     | A            | E        | −          | −    | 274     | I           | 1          |
| VN-3948   | B-sd   | 19               | 1  | R                | −                     | AB           | E        | +          | +    | 226     | IIB          | 2          |
| VN-3959   | B-sw   | 23               | 1  | R                | −                     | A            | E        | −          | −    | 275     | I           | 1          |
| VN-3960   | B-sw   | 24               | 1  | S                | −                     | A            | E        | −          | −    | 126     | I           | 1          |
| VN-3961   | B-sw   | 24               | 1  | R                | −                     | A            | E        | −          | −    | 133     | I           | 1          |
| VN-3962   | B-sw   | 23               | 1  | S                | −                     | A            | E        | −          | −    | 269     | I           | 1          |
| VN-3964   | B-sw   | 27               | 1  | R                | −                     | AB           | E        | +          | +    | 128     | IIB          | 2          |
| VN-3965   | B-sw   | 27               | 1  | I                | −                     | A            | E        | −          | −    | 113     | I           | 1          |
| VN-3966   | B-sw   | 27               | 1  | I                | −                     | A            | E        | −          | −    | 276     | I           | 1          |
| VN-3968   | B-sw   | 27               | 1  | R                | −                     | AB           | E        | +          | +    | 128     | IIB          | 2          |
| VN-3969   | B-sw   | 27               | 1  | R                | +                     | A            | E        | +          | −    | 132     | I           | 2          |
| VN-3970   | B-sw   | 23               | 1  | R                | +                     | A            | E        | +          | −    | 277     | I           | 2          |
| VN-3971   | B-sw   | 25               | 1  | R                | +                     | A            | E        | −          | −    | 278     | I           | 2          |
| VN-3972   | B-sw   | 24               | 1  | R                | +                     | A            | E        | +          | −    | 277     | I           | 2          |
| VN-3973   | B-sw   | 14               | 1  | R                | −                     | A            | E        | −          | −    | 268     | I           | 1          |
| VN-3974   | B-sw   | 15               | 1  | I                | −                     | A            | E        | −          | −    | 279     | I           | 1          |
Table S5. Cont.

| Strain ID | Source | Sampling Site No. | BT | Serum Resistance | Mannitol Fermentation | 16S rRNA Type | vcg Type | Region XII | nanA | MLST-ST | MLST Cluster | Risk Group |
|-----------|--------|-------------------|----|-----------------|----------------------|----------------|----------|-----------|------|---------|-------------|------------|
| VN-3975   | B-sw   | 15                | 1  | R               | −                    | A              | E        | −         | −    | 280     | I            | 1          |
| VN-3976   | B-sw   | 15                | 1  | R               | −                    | AB             | E        | +         | +    | 281     | IIB          | 2          |
| VN-3977   | B-sw   | 15                | 1  | R               | −                    | AB             | E        | +         | +    | 281     | IIB          | 2          |
| VN-3978   | B-sw   | 15                | 1  | R               | +                    | A              | E        | −         | −    | 282     | I            | 2          |
| VN-3979   | B-sd   | 15                | 1  | R               | −                    | AB             | E        | +         | +    | 128     | IIB          | 2          |
| VN-3980   | B-sw   | 27                | 1  | R               | −                    | A              | E        | −         | −    | 269     | I            | 1          |
| VN-3981   | B-sw   | 23                | 1  | R               | −                    | A              | E        | −         | −    | 283     | I            | 1          |
| VN-3982   | B-sw   | 27                | 1  | R               | −                    | A              | E        | −         | −    | 284     | I            | 1          |
| VN-5163   | B-sw   | 28                | 1  | S               | −                    | A              | E        | −         | −    | 65      | I            | 1          |

N, North Sea; B, Baltic Sea; sw, seawater; sd, sediment; R, resistant; I, intermediate resistant; S, susceptible; ST, sequence type.  

a Sampling site numbers shown in Figure 1.  
b Biotype assessed biochemically and by multiplex PCR.  
c Mannitol fermentation tested biochemically and by presence of mannitol fermentation operon (PCR).  
d Risk group 2 comprising strains with two or more pathogenicity markers, risk group 1 comprising strains without or with one pathogenicity marker.
Figure S1. Population structure of *V. vulnificus* biotype 1 isolates from the North Sea (▲) and Baltic Sea (●) based on concatenated MLST sequences of three housekeeping genes (gyrB, dtdS, and pyrC). Bootstrap values above 70% are shown next to the branches. Semicircles around the tree highlight the association of strains to MLST cluster I (white), IIA (grey), and IIB (black). Sequences from clinical (□) and environmental (○) Baltic Sea isolates from a previous study [6] were included for comparison.

References

1 Sanjuan, E.; Amaro, C. Multiplex PCR assay for detection of vibrio vulnificus biotype 2 and simultaneous discrimination of serovar e strains. *Appl. Environ. Microbiol. 2007*, 73, 2029–2032.

2 Bauer, A.; Roervik, L.M. A novel multiplex pcr for the identification of *vibrio parahaemolyticus*, *vibrio cholerae* and *vibrio vulnificus*. *Lett. Appl. Microbiol. 2007*, 45, 371–375.

3 Rosche, T.M.; Yano, Y.; Oliver, J.D. A rapid and simple PCR analysis indicates there are two subgroups of *vibrio vulnificus* which correlate with clinical or environmental isolation. *Microbiol. Immunol. 2005*, 49, 381–389.
4 Cohen, A.L.V.; Oliver, J.D.; DePaola, A.; Feil, E.J.; Boyd, E.F. Emergence of a virulent clade of *vibrio vulnificus* and correlation with the presence of a 33-kilobase genomic island. *Appl. Environ. Microbiol.* 2007, 73, 5553–5565.

5 Vickery, M.C.L.; Nilsson, W.B.; Strom, M.S.; Nordstrom, J.L.; DePaola, A. A real-time pcr assay for the rapid determination of 16s rRNA genotype in *vibrio vulnificus*. *J. Microbiol. Methods* 2007, 68, 376–384.

6 Bier, N.; Bechlars, S.; Diescher, S.; Klein, F.; Hauk, G.; Duty, O.; Strauch, E.; Dieckmann, R. Genotypic diversity and virulence characteristics of clinical and environmental *vibrio vulnificus* isolates from the baltic sea region. *Appl. Environ. Microbiol.* 2013, 79, 3570–3581.

7 Lubin, J.B.; Kingston, J.J.; Chowdhury, N.; Boyd, E.F. Sialic acid catabolism and transport gene clusters are lineage specific in *vibrio vulnificus*. *Appl. Environ. Microbiol.* 2012, 78, 3407–3415.

8 Froelich, B.; Oliver, J. Orientation of mannitol related genes can further differentiate strains of *vibrio vulnificus* possessing the vege allele. *Adv. Stud. Biol.* 2011, 3, 151–160.

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