

**Table S1.** Sampling sites of *Cerastoderma edule* along the English Channel coast of France, mortality rate estimation and diagnostic analyses performed.

Year	Month	Site	Mean mortality rate (%)	Number of individuals	Assays performed			
					Histology	Bacteriology	<i>V. aestuarianus</i> real time PCR	OsHV-1 real time PCR
2012	August	Baie de Somme	89	15 <sup>a</sup>	15	5	15	15
2012	June	Baie des Veys	80	15 <sup>a</sup>	14	nd	15	15
2015	July	Baie de Somme	49	15 <sup>a</sup>	15	5	15	15
2015	July	Binic	35	35 <sup>b</sup>	20	5	15	15
2015	June	Baie des Veys	33	35 <sup>b</sup>	20	5	15	15

<sup>a</sup> All analyses performed on the same individuals.

<sup>b</sup> Histology analyses performed on different individuals.

nd: not done

**Table S2.** Histological, bacteriology and PCR results obtained for *Cerastoderma edule* samples for each location and year included in the present study.

Area		Baie de Somme		Baie des Veys		Binic
Year		2012	2015	2012	2015	2015
Histology n (%) infected individuals	Bacteria	15 (100)	12 (80)	7 (50)	18 (90)	15 (75)
	Rickettsia-like organism	0	0	3 (21)	2 (10)	15 (75)
	Trematod sporocysts	1 (7)	8 (53)	6 (43)	6 (30)	1 (5)
	Trematod metacercaria	3 (20)	2 (13)	0	3 (15)	5 (25)
	Turbellarian-like organism	0	0	3 (21)	1 (5)	1 (5)
	Gregarine spores	9 (60)	4 (27)	8 (57)	11 (55)	15 (75)
	<i>Haplosporidium</i> or <i>Minchinia</i> -like	0	0	0	0	1 (5)
	Ciliates	0	1 (7)	6 (43)	3 (15)	0
	Necrosis	15 (100)	13 (87)	7 (50)	19 (95)	15 (75)
	Haemocytic infiltration	0	13 (87)	6 (43)	20 (100)	9 (60)
	Neoplasia	0	1 (7)	0	1 (5)	0
	Real time PCR, n (%) infected individuals	OsHV-1	0	0	0	0
<i>Vibrio aestuarianus</i>		11 (73)	15 (100)	4 (29)	15 (100)	13 (87)
Bacteria culture, n (%) infected individuals	<i>Vibrio aestuarianus</i>	5 (100)	2 (40)	nd	5 (100)	3 (60)
	<i>Splendidus</i> clade	2 (40)	4 (80)	nd	0	2 (40)

Abbreviation: *nd* not done

**Table S3:** Bacterial strains used and their sources

Strains	Source and date of isolation	References
12/122 1T1	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	Goudenège et al 2015
12/122 1T3	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	This study
12/122 2T3	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	This study
12/122 3T3	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	This study
12/122 4T3	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	This study
12/122 5T3	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, August 2012	This study
15/061 1T1	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2015	This study
15/061 2T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2015	This study
15/061 3T1	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2015	This study
15/061 3T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2016	This study
15/061 4T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2015	This study
15/061 4T4	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2016	This study
15/061 5T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Brévands, France, June 2015	This study
15/064 3T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Binic, France, July 2015	This study

15/064 4T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Binic, France, July 2015	This study
15/075 1T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, July 2015	This study
15/075 3T2	Diseased cockles, ( <i>Ceratoderma edule</i> ), Baie de Somme, France, July 2015	This study
01/032	Diseased oysters ( <i>Crassostrea gigas</i> ), Argenton, June 2001	Garnier et al 2008
01/151	Diseased oysters ( <i>Crassostrea gigas</i> ), La Trinité sur Mer, July 2001	Garnier et al 2008
01/308	Diseased oysters ( <i>Crassostrea gigas</i> ), Normandie, August 2001	Garnier et al 2008
02/041	Diseased oysters ( <i>Crassostrea gigas</i> ), Argenton, June 2002	Garnier et al 2008
02/093	Diseased oysters ( <i>Crassostrea gigas</i> ), Bouin, July 2002	Garnier et al 2008
07/115	Diseased oysters ( <i>Crassostrea gigas</i> ), Bretagne, 2007	Goudenège et al 2015
08/041 2T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/042 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/055 3T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/056 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/081 5T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/090 3T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/093 3T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/110 4T5	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015
08/132 3T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Vendée, 2008	Goudenège et al 2015
08/162 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2008	Goudenège et al 2015

09/006 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2009	Goudenège et al 2015
10/027 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2010	Goudenège et al 2015
10/075 3T2	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2010	Goudenège et al 2015
11/009 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/010 2T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/010 3T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/025 5b	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/026 3a	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/035 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
11/051 11MT1	Diseased oysters ( <i>Crassostrea gigas</i> ), Gironde, 2011	Goudenège et al 2015
11/142 10T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2011	Goudenège et al 2015
12/016 1T1	Diseased oysters ( <i>Crassostrea gigas</i> ), Charente-Maritime, 2012	Goudenège et al 2015
LMG 7909T	<i>V. aestuarianus</i> type strain	Tison et al 1983
15/064 1T2	<i>V. splendidus</i> -related	This study
LMG 13544T	<i>V. ordalii</i>	Schiewe et al. 1982
LMG 7910T	<i>V. furnisii</i>	Brenner et al. 1983

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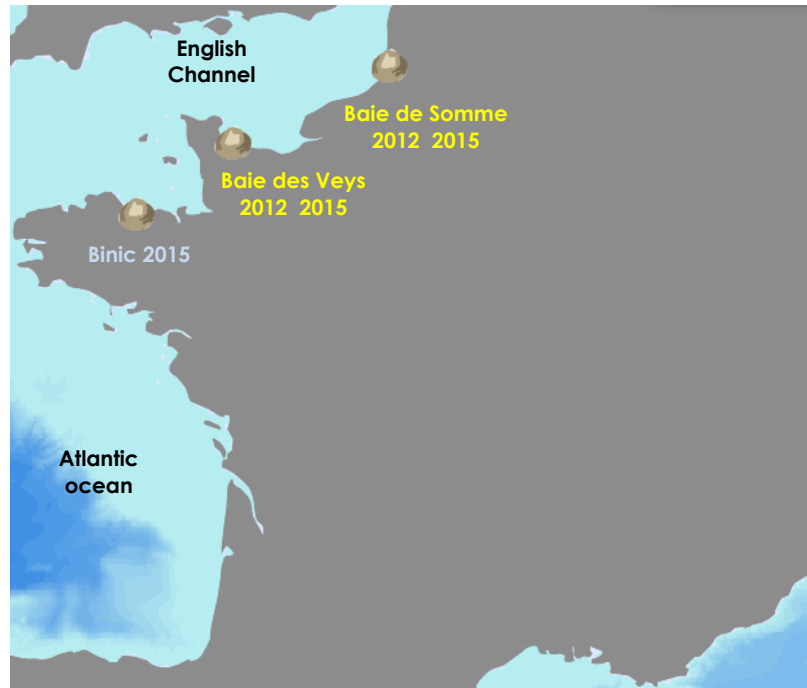
**Table S4:** Genbank accession numbers

Strains	Accession number ( <i>Idh</i> gene)	Accession number ( <i>16s</i> gene)	Accession number ( <i>gyrB</i> gene)
12/122 1T1 (LMG 31437=DSM 109724)	MK315023	MK307681	MK315006
12/122 1T3	MK315024	MK307682	MK315007
12/122 2T3	MK315025	MK307683	MK315008
12/122 3T3 (LMG 31436=DSM 109723)	MK315026	MK307684	MK315009
12/122 4T3	MK315027	MK307685	MK315010
12/122 5T3	MK315028	MK307686	MK315011
15/061 1T1	MK315029	MK307687	MK315012
15/061 2T2	MK315030	MK307688	MK315013
15/061 3T1	MK315031	MK307689	MK315014
15/061 3T2	MK315032	MK307690	MK315015
15/061 4T2 (LMG 31438=DSM 109725)	MK315033	MK307691	MK315016
15/061 4T4	MK315034	MK307692	MK315017
15/061 5T2	MK315035	MK307693	MK315018
15/064 3T2 (LMG 31439=DSM 109719)	MK315036	MK307694	MK315019
15/064 4T2	MK315037	MK307695	MK315020
15/075 1T2	MK315038	MK307696	MK315021
15/075 3T2 (LMG 31440=DSM 109720)	MK315039	MK307697	MK315022

**Table S5:** Comparison of the genomic sequences of 11 *Vibrio aestuarianus* strains based on ANI values obtained with *in silico* methods

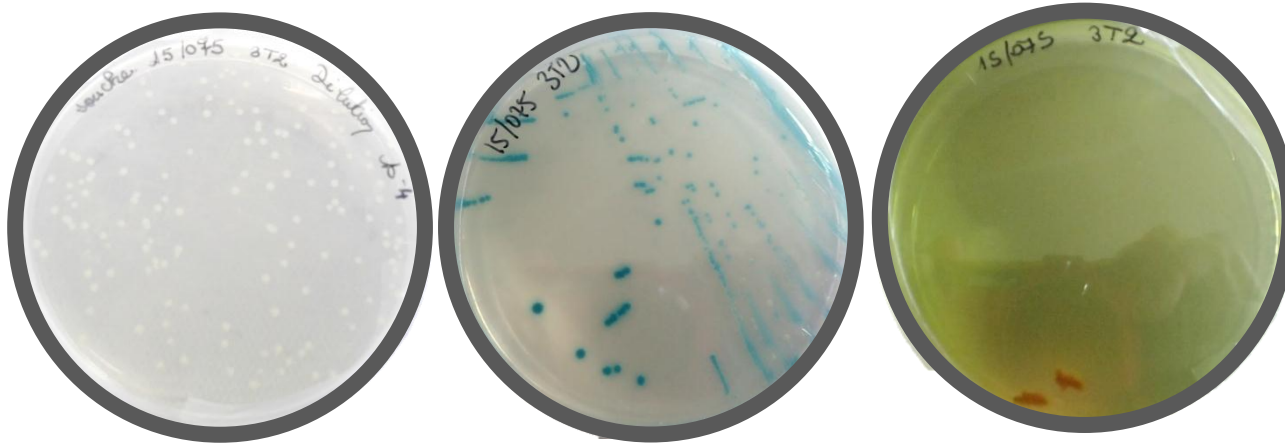
		<i>V. aestuarianus</i> subsp. <i>aestuarianus</i> subsp. nov.	<i>V. aestuarianus</i> subsp. <i>cardii</i> subsp. nov.					<i>V. aestuarianus</i> subsp. <i>francensis</i> subsp. nov.				
		LMG 7909T	12/122_3T3	15/061_1T1	15/064_3T2	15/064_4T2	15/075_3T2	01/032	02/041	07/115	01/151	01/308
<i>V. aestuarianus</i> subsp. <i>aestuarianus</i> subsp. nov	LMG 7909T	/										
<i>V. aestuarianus</i> subsp. <i>cardii</i> subsp. nov	12/122_3T3	97,06	/									
	15/061_1T1	97,28	97,99	/								
	15/064_3T2	97,25	97,97	99,2	/							
	15/064_4T2	97,32	97,9	99,25	99,99	/						
	15/075_32	97,13	98,64	97,89	97,88	98,01	/					
<i>V. aestuarianus</i> subsp. <i>francensis</i> subsp. nov	01/032	97,04	97,56	97,48	97,48	97,7	97,58	/				
	02/041	97,52	97,72	97,68	97,63	97,7	97,8	99,98	/			
	07/115	96,96	97,54	97,52	97,48	97,7	97,51	99,99	99,58	/		
	01/151	96,83	97,5	97,53	97,51	97,71	97,34	99,94	99,59	99,87	/	
	01/308	96,86	97,37	97,37	97,37	97,68	97,36	99,6	99,21	99,59	99,51	/

**Figure S1.** Map of the French English Channel coast affected by cockles mortality





**Figure S2.** Culture aspect on Zobell, Chromagar and TCBS after 48h at 20°C of *Vibrio aestuarianus* subsp. *cardii* subsp. nov.



**Figure S3.** Core genome, specific genome and virulome comparisons. (A) Venn diagram indicating common and variable genome proportion for each genome, (B) Presence (green) or absence (red) of predicted CDS encoding putative virulence factors in the 3 representative genomes (LMG7909T for *V. aestuarianus aestuarianus* subsp. nov, 02-041 for *V. aestuarianus francensis* subsp. nov and 12-122 3T3 for *V. aestuarianus cardii* subsp. nov).

