

Supporting information. Competition for food reduces disease susceptibility in a marine invertebrate. Fabrice Pernet, Klervi Lague and Bruno Petton. *Ecosphere*.

Appendix S2. Supplemental data relative to oyster mortality and virus load in the flow through system.

We designed a 3-level open-flow system where virus-contaminated seawater enriched with phytoplankton (level 1) was distributed to 12 experimental units, each consisting of one tank containing the competing filter-feeders (level 2) connected to one recipient tank containing the recipient oysters (level 3, Figure 1). Oysters injected with viral suspension in the adductor muscle were kept in a 200-L tank in static seawater for 24 h in cohabitation with two groups of SPF oysters (not injected with OsHV-1) to monitor disease transmission and mortality. Then, the seawater surrounding the donors (contaminated with the virus) was distributed toward the experimental units containing competitors and recipients. For each experimental unit, the water flow from the source of infection was 4.2 % of the total water flow. Here we reported survival of oysters placed in the virus-contaminated seawater (injected and cohabited oysters in level 1), in the tanks containing the competing filter-feeders (level 2), and in the recipient tanks (acclimated control not exposed to competitors, level 3). The mortality risks of oysters were compared using the Cox regression model.

Mortality of injected donors (level 1) started abruptly 42 h after injection (18 h after exposing the recipient oysters to the source of infection, Figure S1) and survival stabilized at 37%. The mortality of SPF oysters placed in the same tank (level 1) began gradually 2 days after that of the injected donors, corresponding to the time necessary for the transmission

of the disease, infection and expression in new hosts (Schikorski et al. 2011). Survival of cohobated oysters was higher (52%) than that of injected donors (Table S4), presumably reflecting the different routes of infection (Schikorski et al. 2011).

The mortality of SPF oysters placed downstream and used as competing filter-feeders (level 2) or recipients (acclimated control in level 3) started at the same time as that of oysters cohobated with the donors but more gradually (Figure S1). Also, survival of oysters in levels 2 and 3 was much higher than that of those cohobated in level 1 (Table S4), probably reflecting dilution of the virus contaminated seawater (Figure S2). Virus DNA concentration in the seawater at the outlet of the injected donors was 1 log higher than that measured at the inlets of competitor and recipient tanks (Figure S2), and oyster mortality is associated with viral load in the seawater (Paul-Pont et al. 2015, Petton et al. 2019).

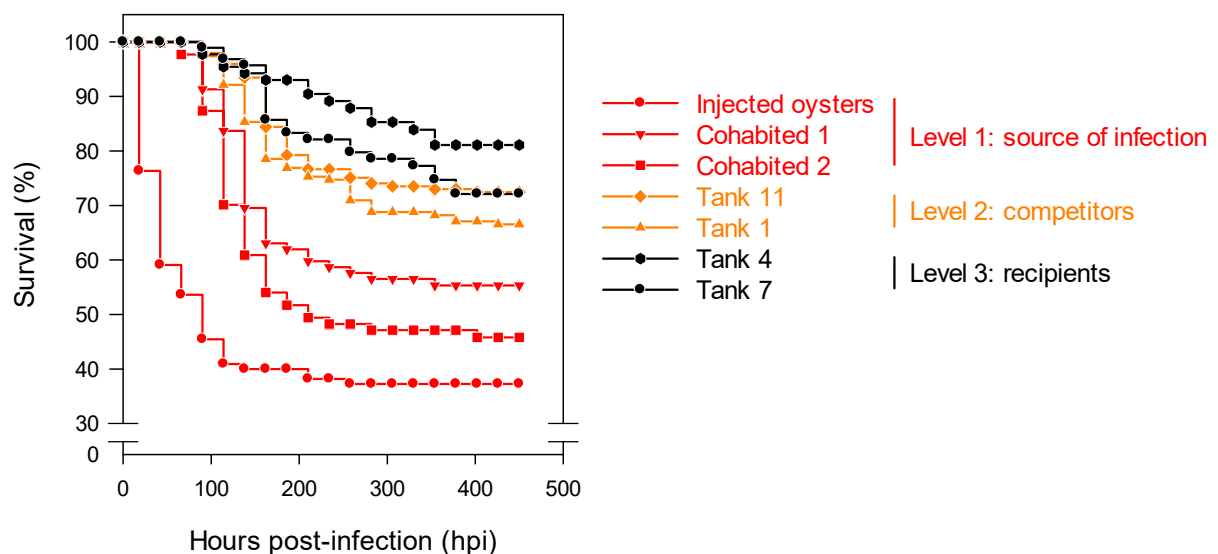


Figure S1. Survival of oysters in the level 1 (injected donors or cohobated oysters), level 2 (juvenile oyster placed in the tanks containing the competitors) and level 3 (recipient oyster placed in the control tanks).

Table S2. Contrast from the cox regression model.

Contrast	Estimate	SE	χ^2	P	Odds ratio
Injected vs cohabited (level 1)	1.399	0.373	14.1	<0.001	4.1
Recipients in level 1 vs 2	1.385	0.269	26.5	<0.001	4.0
Recipients in level 2 vs 3	0.748	0.356	4.4	0.035	2.1

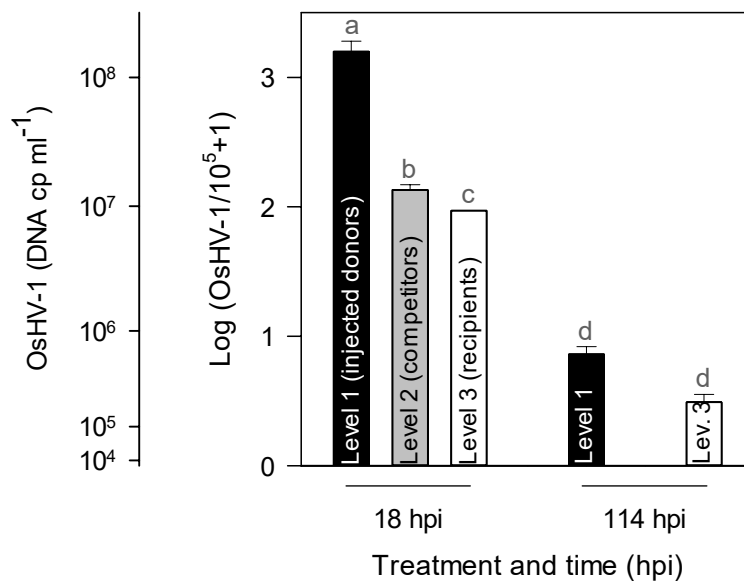


Figure S2. Levels of OsHV-1 DNA in the seawater at the outlet of tanks containing injected donors (level 1) and at the input of tanks containing the competitors (level 2) and the recipients (level 3) 18- and 114-hours post-infection (hpi). For level 3, only data from control (empty) tanks were considered here.

Literature cited

Paul-Pont, I., O. Evans, N. K. Dhand, and R. J. Whittington. 2015. Experimental infections of Pacific oyster *Crassostrea gigas* using the Australian ostreid herpesvirus-1 (OsHV-1) μ Var strain. *Diseases of Aquatic Organisms* **113**:137-147.

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Schikorski, D., N. Faury, J. F. Pepin, D. Saulnier, D. Tourbiez, and T. Renault. 2011. Experimental ostreid herpesvirus 1 infection of the Pacific oyster *Crassostrea gigas*: Kinetics of virus DNA detection by q-PCR in seawater and in oyster samples. *Virus Research* **155**:28-34.