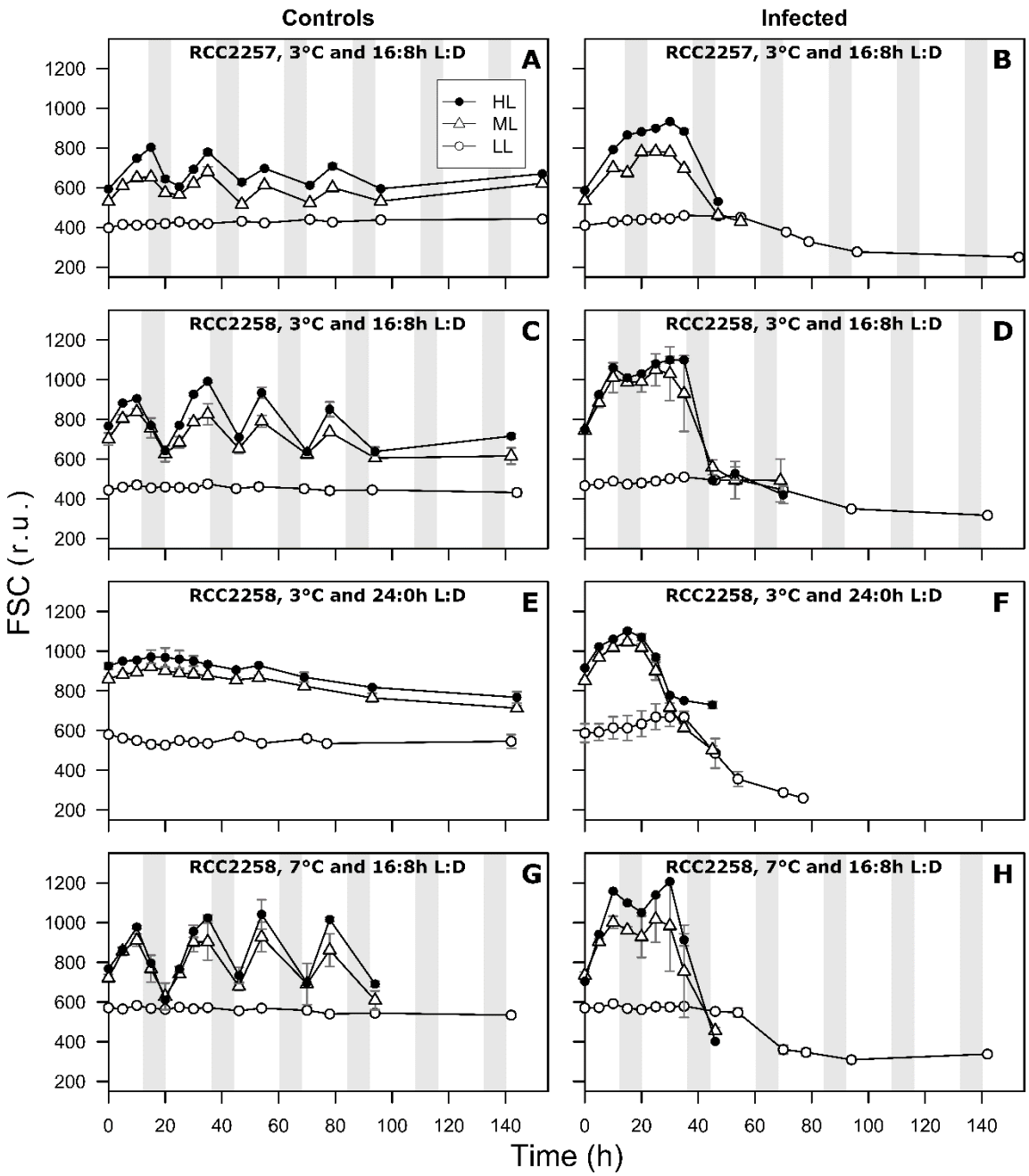


**Figure S1.** Temporal dynamics of cellular forward scatter (FSC) for non-infected controls and MpoV-45T infected *Micromonas polaris* RCC2257 (A, B) and RCC2258 (C-H), cultured at 3 °C (A-F) and 7 °C (G, H), with a 16:8 h (A-D, G, H) and 24:0 h (E,F) light:dark (L:D) cycle and different light intensities (LL, ML and HL, i.e. respectively, 5, 60 and 160 µmol quanta $m^{-2}$ $s^{-1}$). The grey bars represent the 8 h dark period. LL at 3 °C and 16:8 h L:D cycle and ML at 7 °C and 16:8 h L:D have n=4, ML at 3 °C and 16:8 h L:D has n=6, all the other conditions have n=2, error bars represent standard deviation. r.u. stands for relative units. For the controls, the maximum values displayed the interphase of mitosis. During the subsequent night these cells showed a synchronized cell division that lead to a drop in the cellular signals. The continuous light (24:0 h L:D) treatments did not exhibit a distinct diel cycle due to non-synchronized growth. Viral infection halted the diel dynamics of the cellular characteristics.

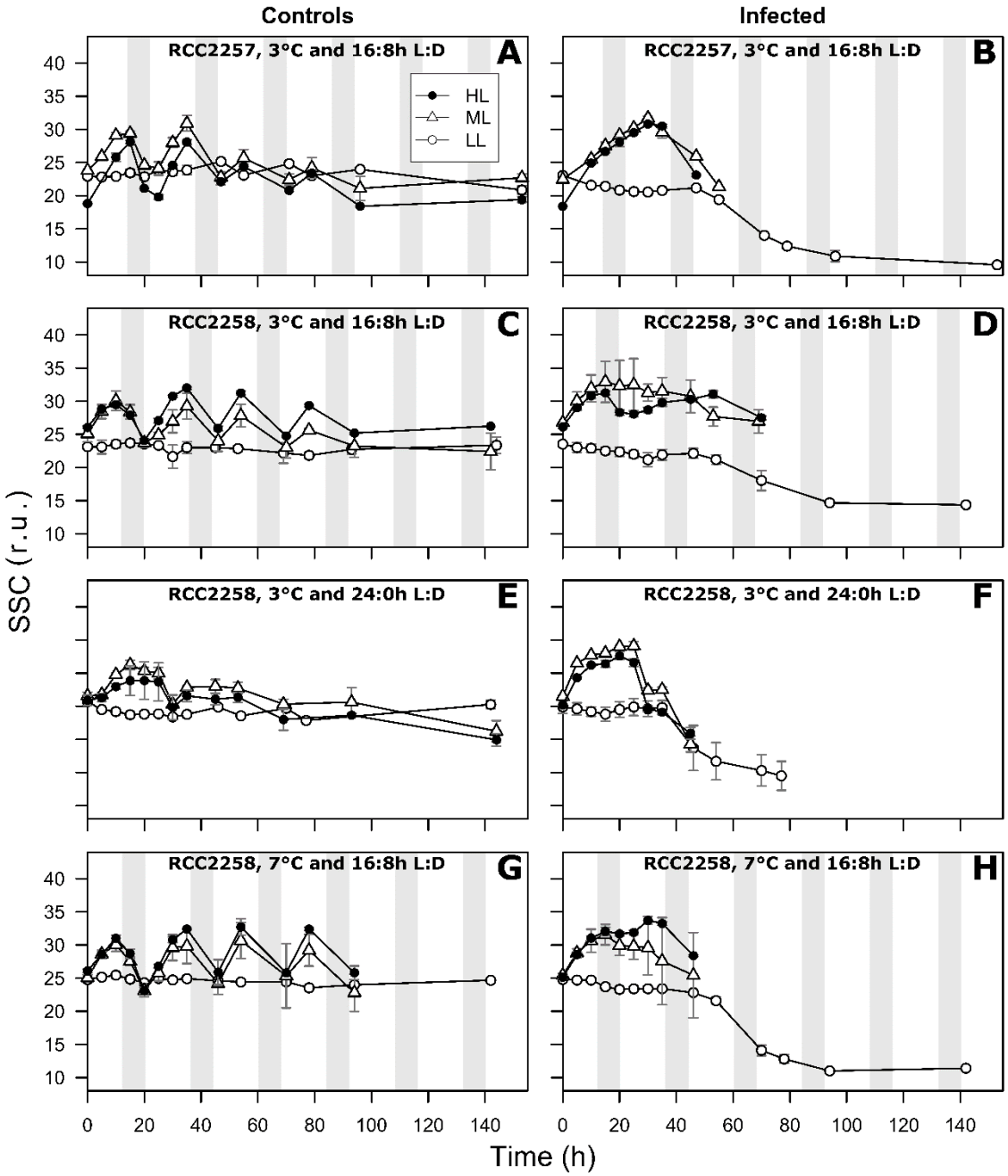


**Figure S2.** Temporal dynamics of cellular side scatter (SSC) for non-infected controls and MpoV-45T infected *Micromonas polaris* RCC2257 (A, B) and RCC2258 (C-H), cultured at 3 °C (A-F) and 7 °C (G, H), with a 16:8 h (A-D, G, H) and 24:0 h (E, F) light:dark (L:D) cycle and different light intensities (LL, ML and HL, i.e. respectively, 5, 60 and 160 µmol quanta $m^{-2}$ $s^{-1}$). The grey bars represent the 8 h dark period. LL at 3 °C and 16:8 h L:D cycle and ML at 7 °C and 16:8 h L:D have n=4, ML at 3 °C and 16:8 h L:D has n=6, all the other conditions have n=2, error bars represent standard deviation. r.u. stands for relative units. For the controls, the maximum values displayed the interphase of mitosis. During the subsequent night these cells showed a synchronized cell division that lead to a drop in the cellular signals. The continuous light (24:0 h L:D) treatments did not exhibit a distinct diel cycle due to non-synchronized growth. Viral infection halted the diel dynamics of the cellular characteristics.

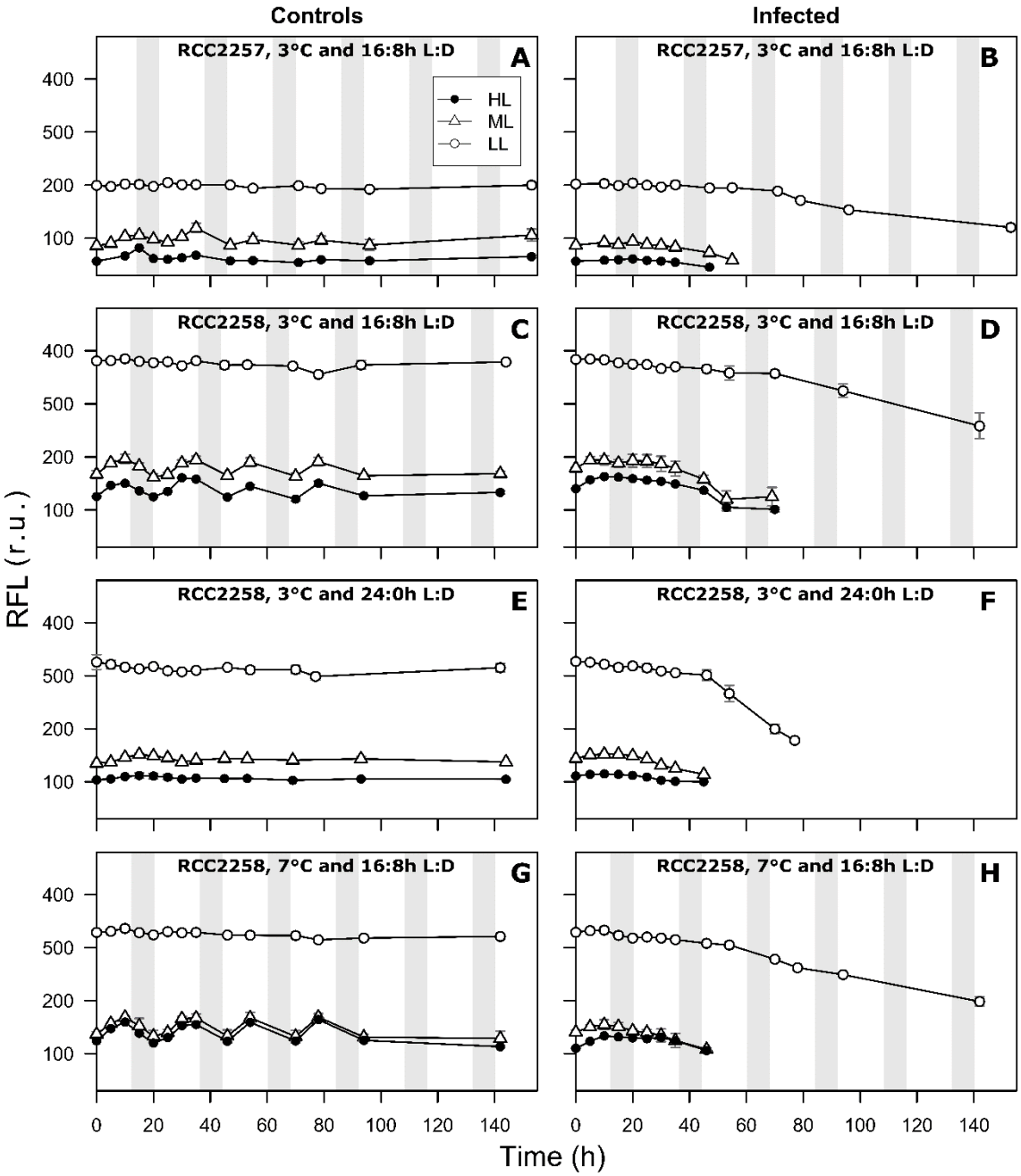


**Figure S3.** Temporal dynamics of cellular chlorophyll red autofluorescence (RFL) for non-infected controls and MpoV-45T infected *Micromonas polaris* RCC2257 (A, B) and RCC2258 (C-H), cultured at 3 °C (A-F) and 7 °C (G, H), with a 16:8 h (A-D, G, H) and 24:0 h (E, F) light:dark (L:D) cycle and different light intensities (LL, ML and HL, i.e. respectively, 5, 60 and 160 μmol quanta $m^{-2}$ $s^{-1}$). The grey bars represent the 8 h dark period. LL at 3°C and 16:8 h L:D cycle and ML at 7 °C and 16:8 h L:D have n=4, ML at 3°C and 16:8 h L:D has n=6, all the other conditions have n=2, error bars represent standard deviation. r.u. stands for relative units. The maximum values displayed the interphase of mitosis. During the subsequent night these cells showed a synchronized cell division that lead to a drop in the cellular signals (Figure S1). The continuous light (24:0 h L:D) treatments did not exhibit a distinct diel cycle due to non-synchronized growth.

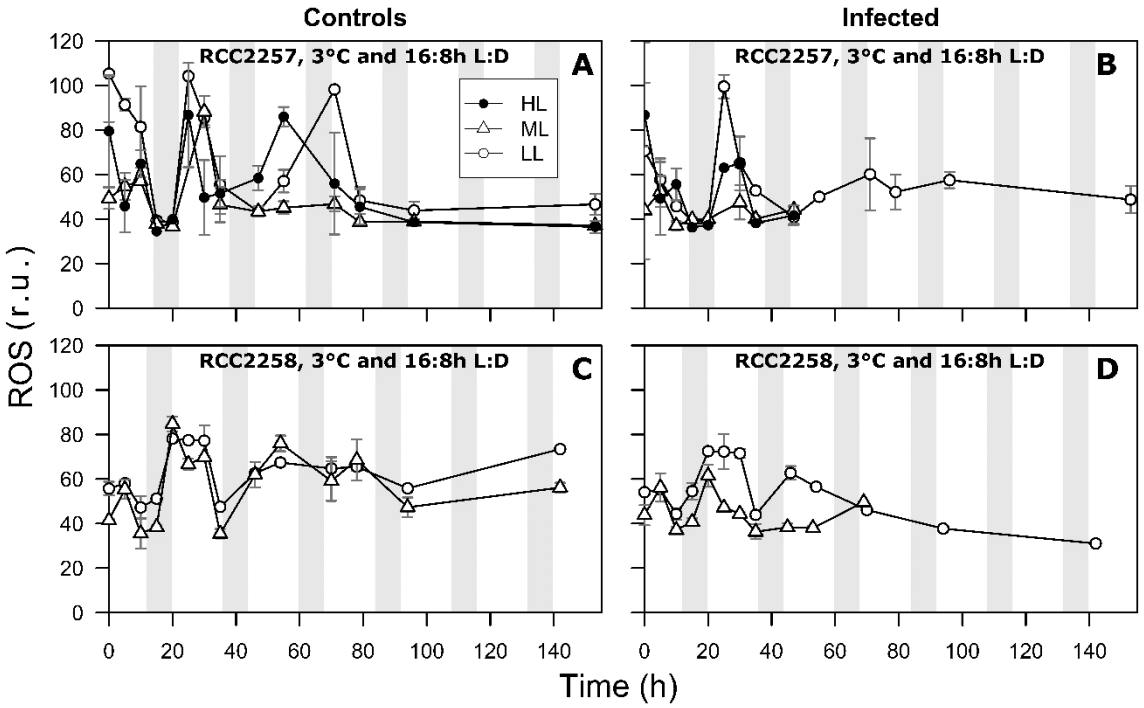


**Figure S4.** Temporal dynamics of cellular reactive oxygen species (ROS) green fluorescence for non-infected controls and MpoV-45T infected *Micromonas polaris* RCC2257 (A, B) and RCC2258 (C, D), cultured at 3 °C with a 16:8 h light:dark (L:D) cycle and different light intensities (LL, ML and HL, i.e. respectively, 5, 60 and 160 μmol quanta $m^{-2}$ $s^{-1}$). The grey bars represent the 8 h dark period. All the conditions have n=2, error bars represent standard deviation. r.u. stands for relative units. The mean cellular ROS also showed a diel cycle with higher signals at the first light of the day, reducing during the day until it reached a minimum during the night.

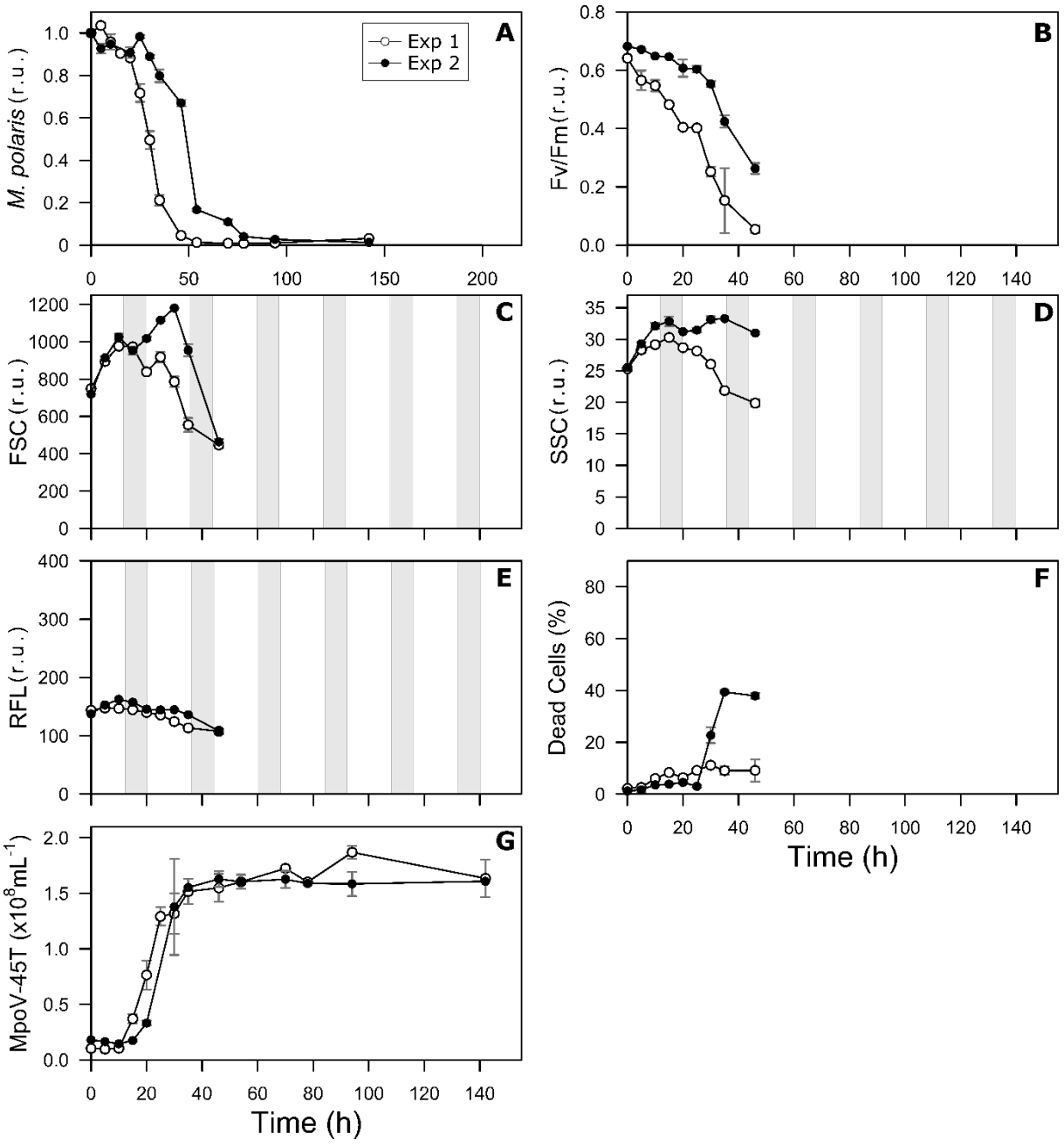


**Figure S5.** Temporal dynamics, during two independent experiments (Exp 1 and Exp 2), of algal abundances (A, normalized to initial abundance), Fv/Fm (B), mean cellular FSC (C), SSC (D) and RFL (E) from infected *Micromonas polaris* RCC2258 cultured at ML light intensity (60 µmol quanta $m^{-2}$ $s^{-1}$), 16:8 h light:dark and 7 °C. MpoV-45T abundances were comparable for the two experimental replicates Exp 1 and Exp 2 (G). Error bars represent standard deviation and r.u. stands for relative units.

**Table S1**. Statistical two-way ANOVA of treatments (three levels for light intensity, two levels for light cycle, temperature and host strain) with interaction terms affecting *M. polaris* growth and cellular characteristics. The treatments that were found to significantly influence exponential growth rate, Fv/Fm, FSC, SSC, RFL, and ROS by asterisks**:** *, ** and *** represent P-values <0.05, <0.01 an <0.001. n.s. stands for not significant, and NA for not available.

| Host strain | Temp. | Light cycle | Factor | Growth | Fv/Fm | FSC | SSC | RFL | ROS |
|---|---|---|---|---|---|---|---|---|---|
| RCC2257 | | | Strain | *** | n.s. | *** | *** | *** | n.s. |
| *vs* | 3 °C | 16:8 h | Light intensity | *** | n.s. | *** | *** | *** | n.s. |
| RCC2258 | | | Interaction | n.s. | n.s. | ** | *** | *** | n.s. |
| | | 16:8 h | Light cycle | *** | ** | *** | ** | *** | *NA* |
| RCC2258 | 3 °C | vs | Light intensity | *** | ** | *** | *** | *** | *NA* |
| | | 24:0 h | Interaction | * | *** | ** | n.s. | *** | *NA* |
| | 3 °C | | Temperature | *** | n.s. | *** | ** | *** | n.s. |
| RCC2258 | vs | 16:8 h | Light intensity | *** | n.s. | *** | *** | *** | * |
| | 7 °C | | Interaction | *** | n.s. | ** | * | *** | n.s. |

**Table S2.** Statistical two-way ANOVA of treatments (three levels for light intensity, two levels for light cycle, temperature and host strain) with interaction terms affecting infection dynamics for *M. polaris* host (drop in Fv/Fm, start of lysis and full lysis of the culture) and MpoV-45T (latent period, maximum production and burst size). The treatments that were found to be significant are indicated by asterisks**:** *, ** and *** represent P-values <0.05, <0.01 an <0.001. n.s. stands for not significant. The Tukey's test following the two-way ANOVA showed consistently that ML and HL were comparable while LL was significantly different from ML and HL (for all tests p<0.0001).

| Host strain | Temp. | Light cycle | Factor | Drop Fv/Fm | Lysis Start | Full Lysis | Latent Period | Max. Prod. | Burst Size |
|---|---|---|---|---|---|---|---|---|---|
| RCC2257 | | | Strain | ** | ** | n.s. | *** | n.s. | n.s. |
| *vs* | 3 °C | 16:8 h | Light intensity | *** | *** | *** | *** | *** | *** |
| RCC2258 | | | Interaction | ** | *** | ** | * | * | n.s. |
| | | 16:8 h | Light cycle | *** | *** | *** | *** | * | * |
| RCC2258 | 3 °C | vs | Light intensity | *** | *** | *** | *** | *** | *** |
| | | 24:0 h | Interaction | n.s. | *** | *** | n.s | *** | n.s. |
| | 3 °C | | Temperature | *** | *** | * | *** | *** | ** |
| RCC2258 | vs | 16:8 h | Light intensity | *** | *** | *** | *** | *** | *** |
| | 7 °C | | Interaction | n.s. | ** | n.s. | * | * | n.s. |