The following supplements accompany the article

Impacts of macroalgal competition and parrotfish predation on the growth of a common bioeroding sponge

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Supplement. Graphical evaluation of the statistical models fitted to test the effects of macroalgal competition and predation on the growth of *Cliona tenuis*. Also presented is a photographic record of *C. tenuis* after the observational period to depict the growth of individuals and the absence of collateral damage by reference nails

Supplement 1. Graphical evaluation of fitted models. The following figures show the evaluation of residuals from the fitted models in Studies 1 and 2. Please refer to the 'Materials and Methods' section in the main article for details. This evaluation was done using graphical methods for normality and homoscedasticity, as detailed in Rutherford (2004), McGuinness (2002) and Zuur et al. (2009).

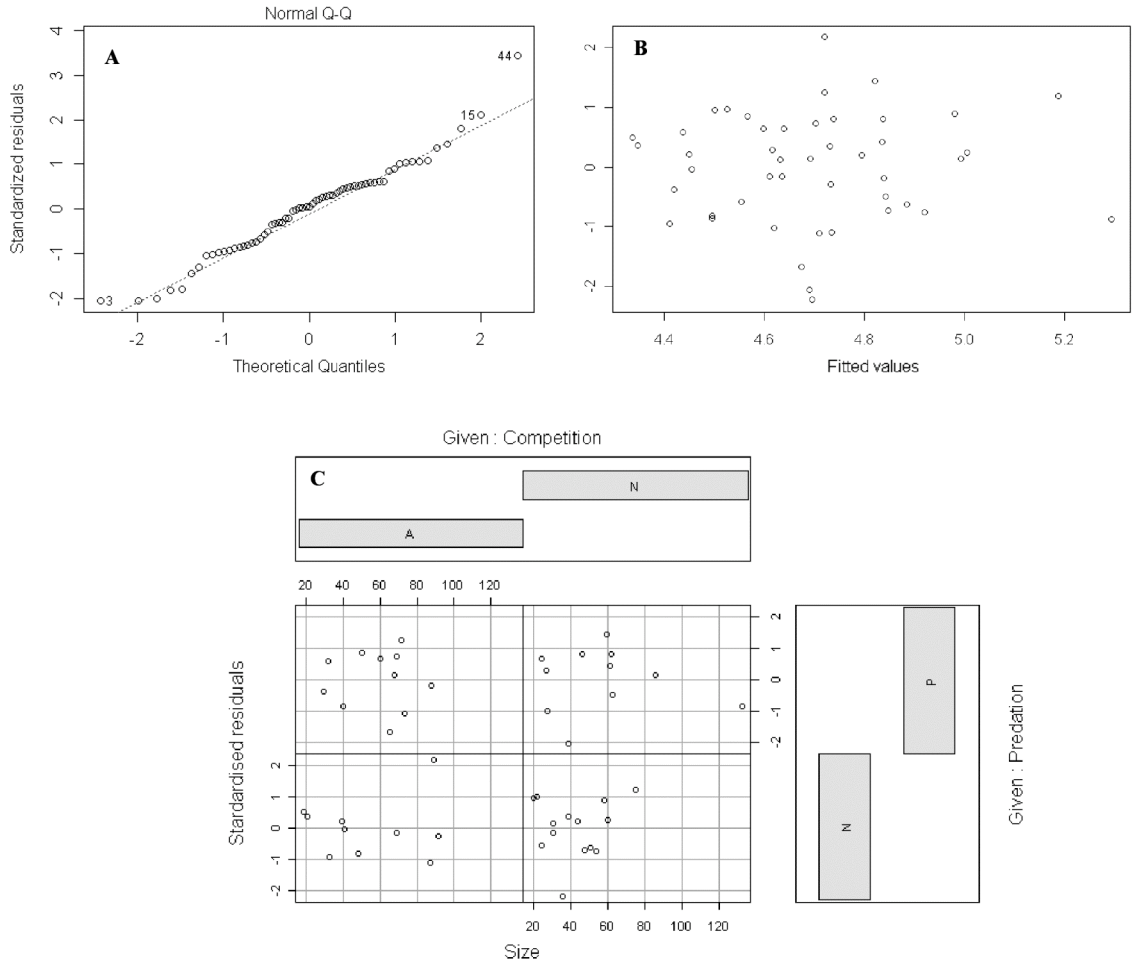

Fig. S1. Graphical evaluation of normality and homoscedasticity of residuals after fitting the analysis of covariance to test the effect of competition and predation on the growth of *Cliona tenuis*. Please refer to 'Materials and methods. Study 1: manipulation of predation and competition' in the main article for details. (A) Q-Q plot (Q: quantile) of the standardised residuals against the theoretical quantiles in a normal distribution. The dashed line shows the expected normal distribution of residuals and the open circles, the observed distribution. This plot shows that the distribution of residuals is similar to the expected normal distribution. (B) The distribution of residuals across the fitted space, where no dispersion is observed. (C) Combined plot of the standardised residuals within the levels of the explanatory variables Predation (P) and Competition (A), where N represents absence of Predation or Competition accordingly. This combined plot also depicts the interaction of treatments with the covariate (Size, cm^2). The graphs show a homogeneous distribution of results across the parameter space

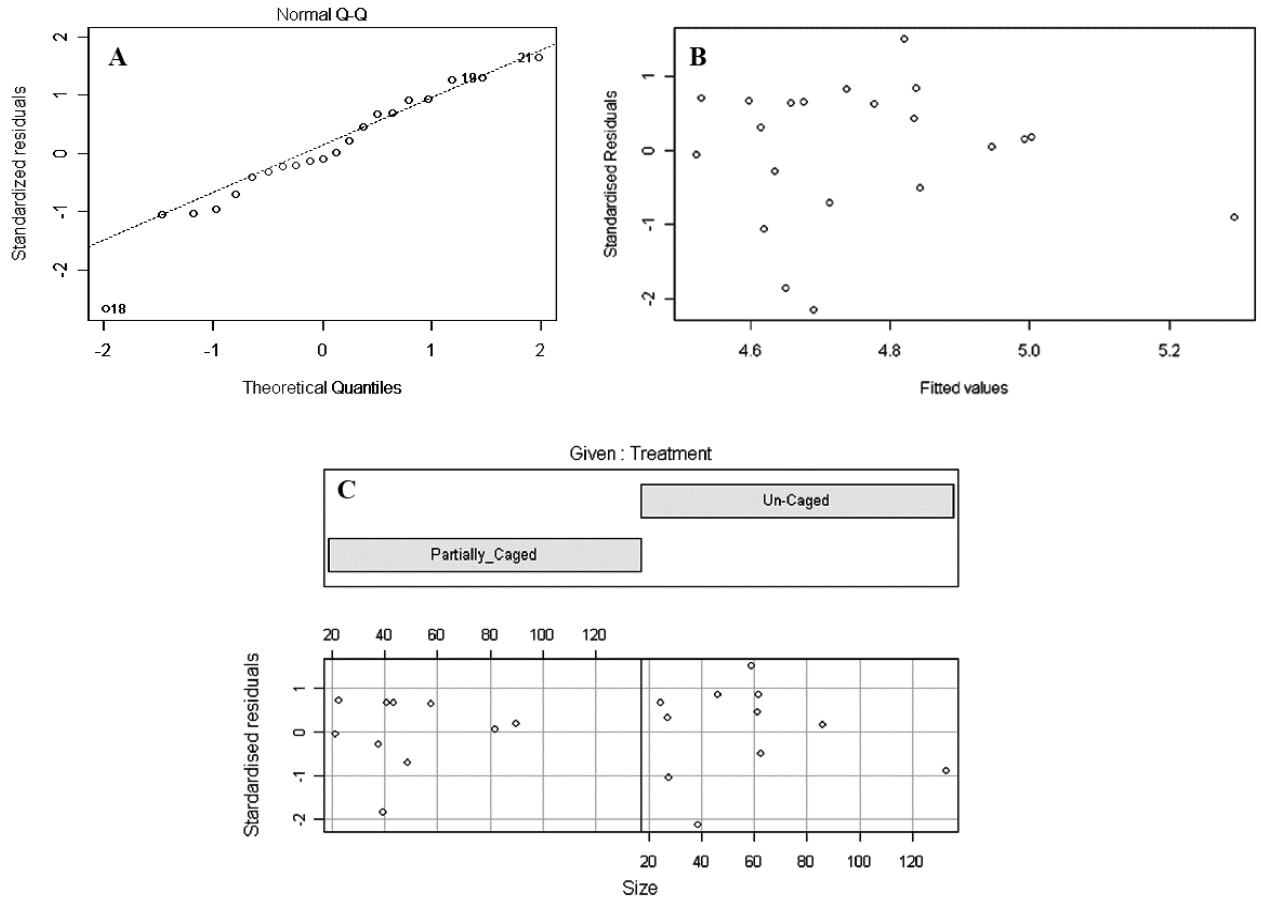

Fig. S2. Graphical evaluation of residuals after fitting the analysis of covariance to test the effect of caging on the growth of *Cliona tenuis,* for Predation treatments (T2 and T6). Please refer to 'Materials and methods. Study 1: manipulation of predation and competition' in the main article for details. (A) Q-Q plot of the standardised residuals against the theoretical quantiles in a normal distribution. The dashed line shows the expected normal distribution of residuals and the open circles, the observed distribution. This plot shows that the distribution of residuals is similar to the expected normal distribution. (B) The distribution of residuals across the fitted space. No overall trend is observed, indicating lack of dispersion. (C) Combined plot of the standardised residuals within the levels of the explanatory variable (Treatment), accounting for the interaction with the covariate (Size, cm^2). The graphs show a homogeneous distribution of results across the parameter space

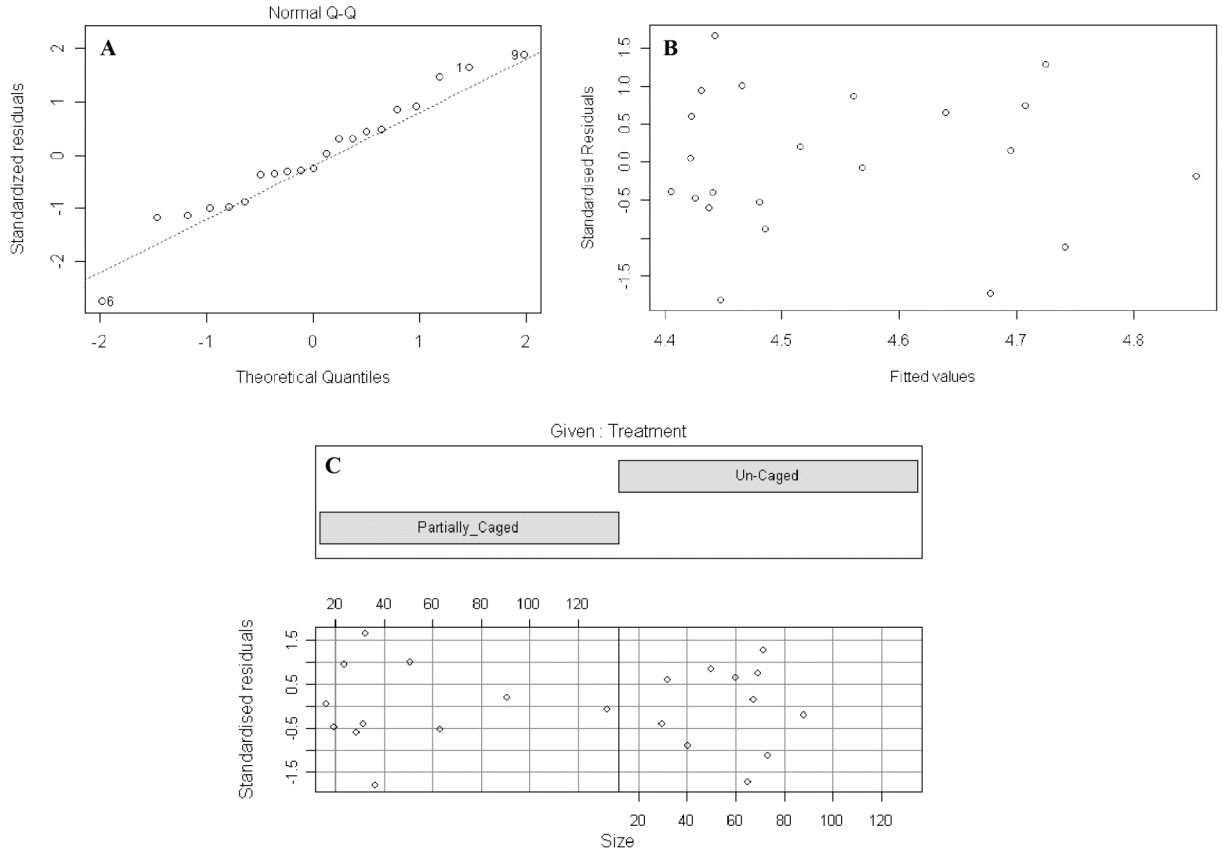

Fig. S3. Graphical evaluation of residuals after fitting the analysis of covariance to test the effect of caging on the growth of *Cliona tenuis,* for Interaction treatments (T2 and T6). Please refer to 'Materials and methods. Study 1: manipulation of predation and competition' in the main article for details. (A) Q-Q plot of the standardised residuals against the theoretical quantiles in a normal distribution. The dashed line shows the expected normal distribution of residuals and the open circles, the observed distribution. This plot shows that the distribution of residuals is similar to the expected normal distribution. (B) The distribution of residuals across the fitted space. No overall trend is observed, indicating lack of dispersion. (C) Combined plot of the standardised residuals within the levels of the explanatory variable (Treatment), accounting for the interaction with the covariate (Size, cm^2). The graphs show a homogeneous distribution of results across the parameter space

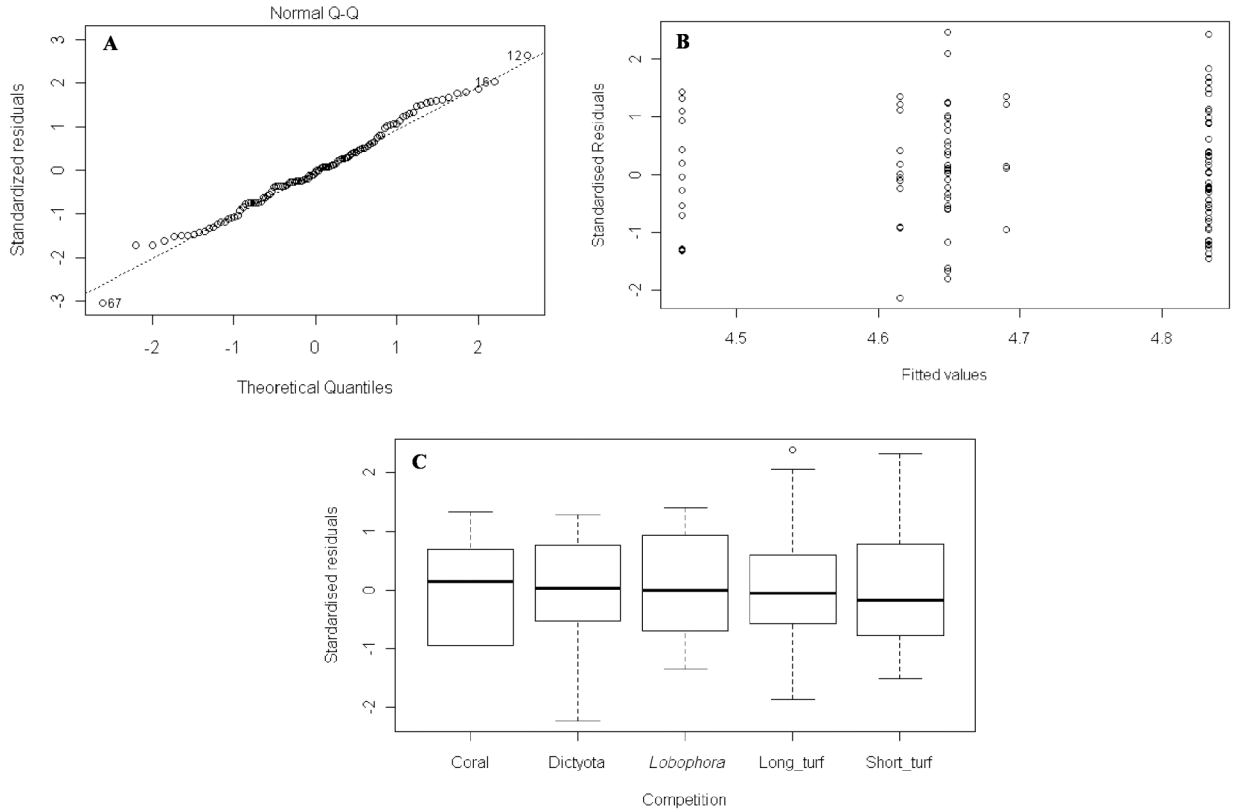

Fig. S4. Graphical evaluation of normality and homoscedasticity of residuals after fitting the General Linear Model to test the effect of different competitors on the linear extension of *Cliona tenuis* (for details see 'Materials and methods. Study 2: unmanipulated interactions of *Cliona tenuis* with other competitors' in the main article). (A) Q-Q plot of the standardised residuals against the theoretical Quantiles in a normal distribution. The dashed line shows the expected normal distribution of residuals and the open circles, the observed distribution. This plot shows that the distribution of residuals is similar to the expected normal distribution. (B) The residuals of the model to evaluate the homogeneity of variance across the fitted space. The solid line shows no overall trend, implying homoscedasticity. Four outlier samples were removed from the analysis and the average is reported in 'Results'. The samples were removed because we were uncertain if they remained in competition over the evaluated time, which coincided with the outlying behaviour observed. (C) Box plot of the residuals among the 5 levels of the explanatory variable. The graph demonstrates that the variability of residuals remains constant among levels of the explanatory variable. Data points out of the 5th and 95th confidence intervals (bars) are represented by dots and the boxes indicate the inter-quartile range. The solid line inside the box represents the median

LITERATURE CITED

McGuinness KA (2002) Of rowing boats, ocean liners and tests of the ANOVA homogeneity of variance assumption. Austral Ecol 27:681–688

Rutherford A (2004) Introducing ANOVA and ANCOVA: A GLM approach. SAGE, London

Zuur AF, Ieno EN, Walker NJ, Saveliev AA, Smith GM (2009) Mixed effects models and extensions in ecology with R. Springer, New York, NY

Supplement 2. Evidence of growth without collateral damage to the sponge tissue during the observational study

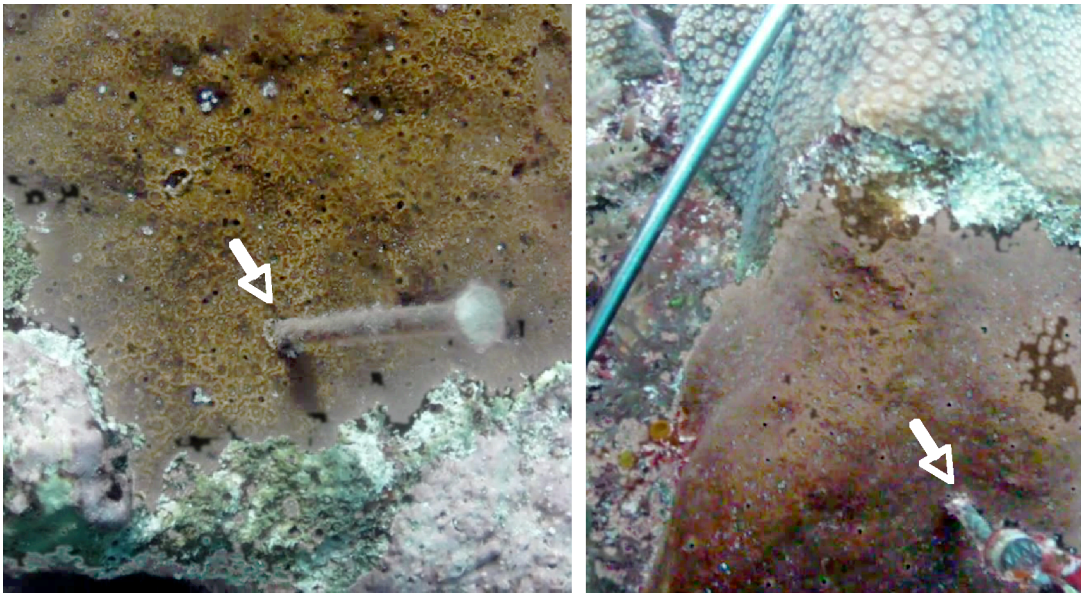

Fig. S5. *Cliona tenuis*. Individuals evaluated during Study 2 (for details see 'Materials and methods. Study 2: unmanipulated interactions of *Cliona tenuis* with other competitors' in the main article). For this study, sponges were tagged and followed over 286 d to compare the linear advance of the individuals under constant competition with the main benthic components in the reef. The images show the individuals at the end of the study. No damage can be seen as a consequence of driving in the stainless steel nail (white arrows) on the edge of the individual at the beginning of the observational period