***Supplementary Material***

**Contraction Dynamics and Respiration of Small Single-Osculum Explants of the Demosponge *Halichondria panicea***

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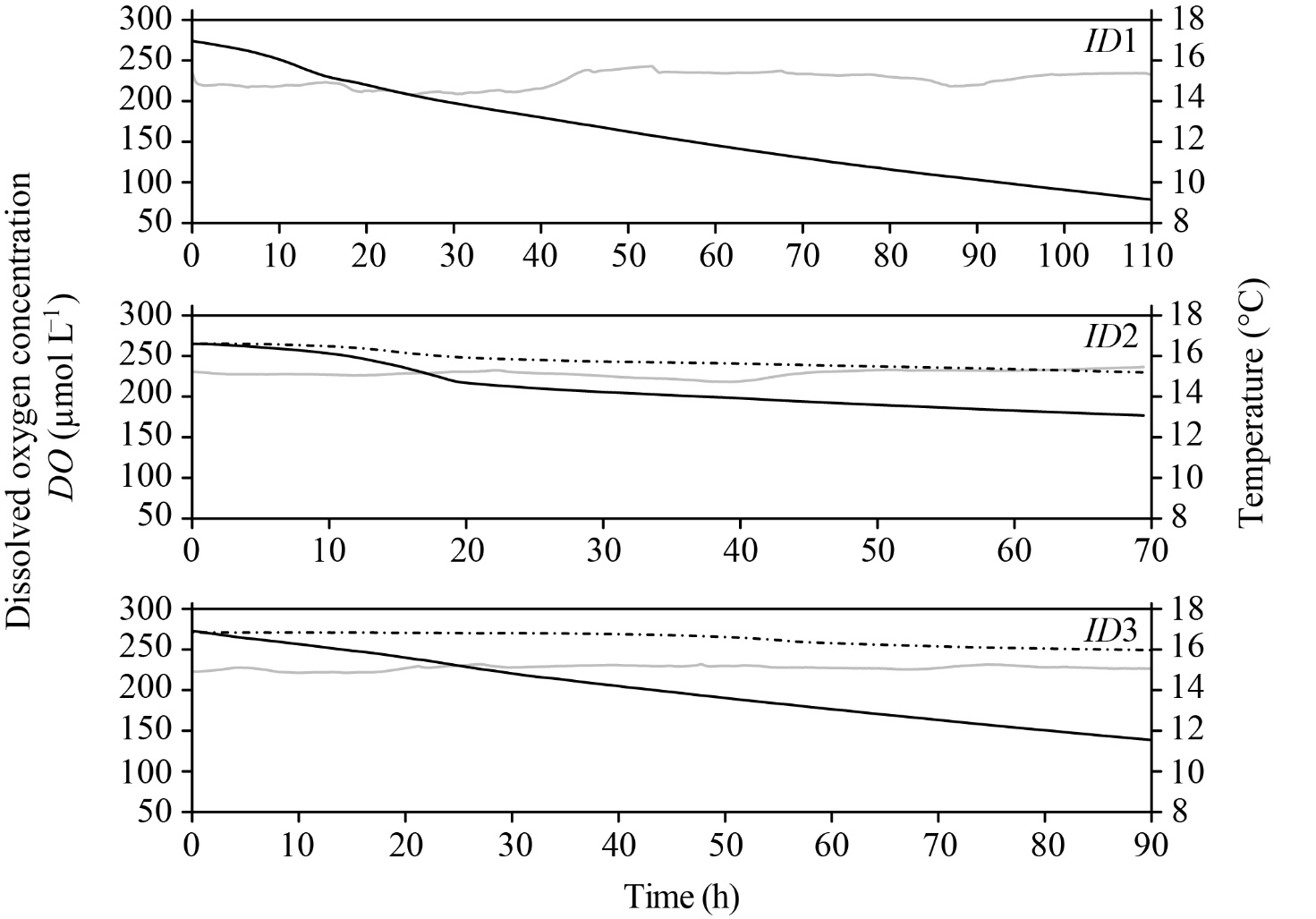


Figure S1. *Halichondria panicea*. Dissolved oxygen concentration (*DO*, µmol L-1; dark line) as a function of time in respiration experiments with single-osculum explants (identification number = *ID*1 to *ID*3) in experimental chamber (*V* = 29.4 ml) with well-mixed (0.2 µm) filtered seawater (20 PSU). The dashed lines show the *DO* in the control chamber (i.e. with glass slide without sponge explant). Both the temperature (grey line) and *DO* was recorded every 5 s (*ID*2) or 10 s (*ID*1 and *ID*3).

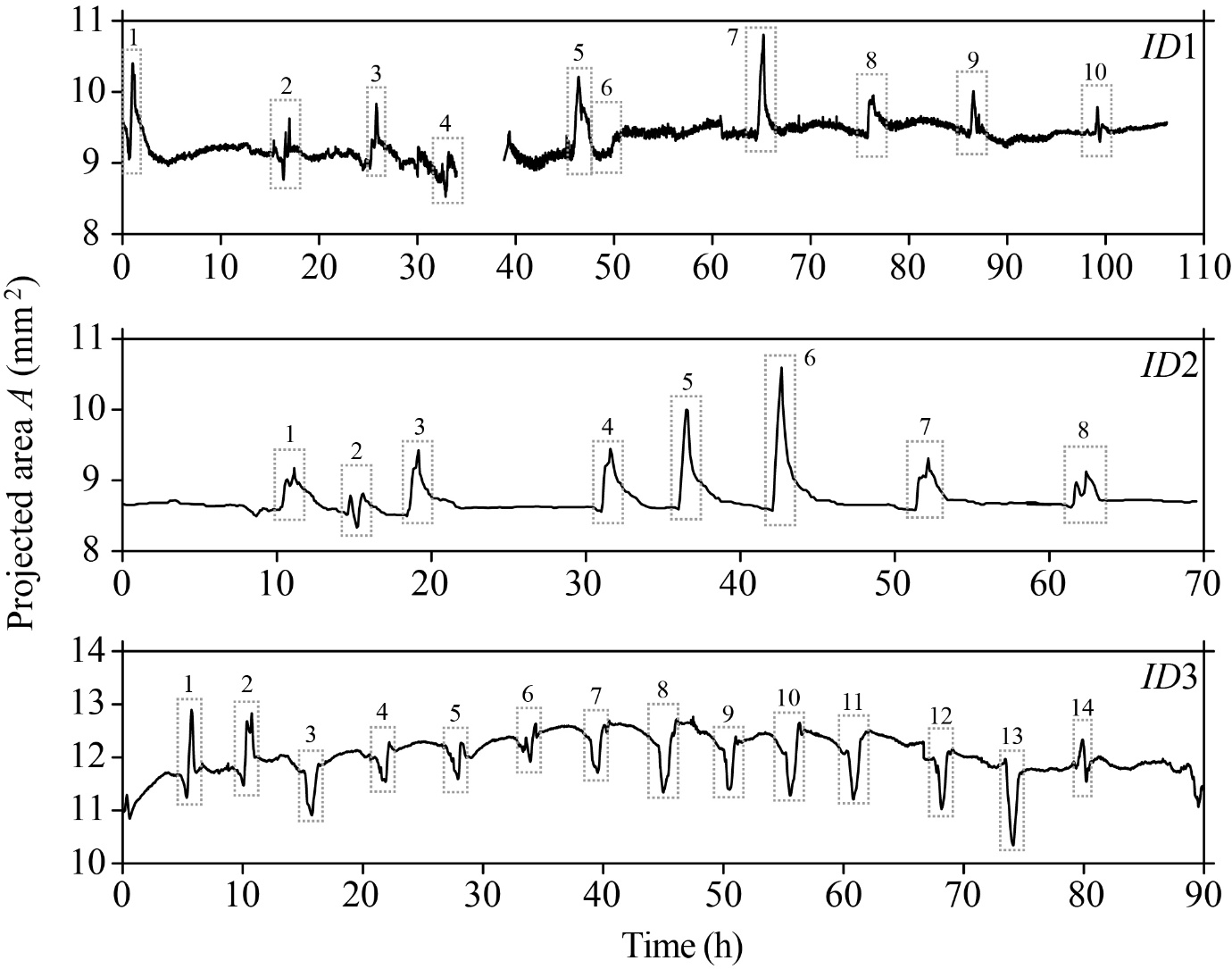
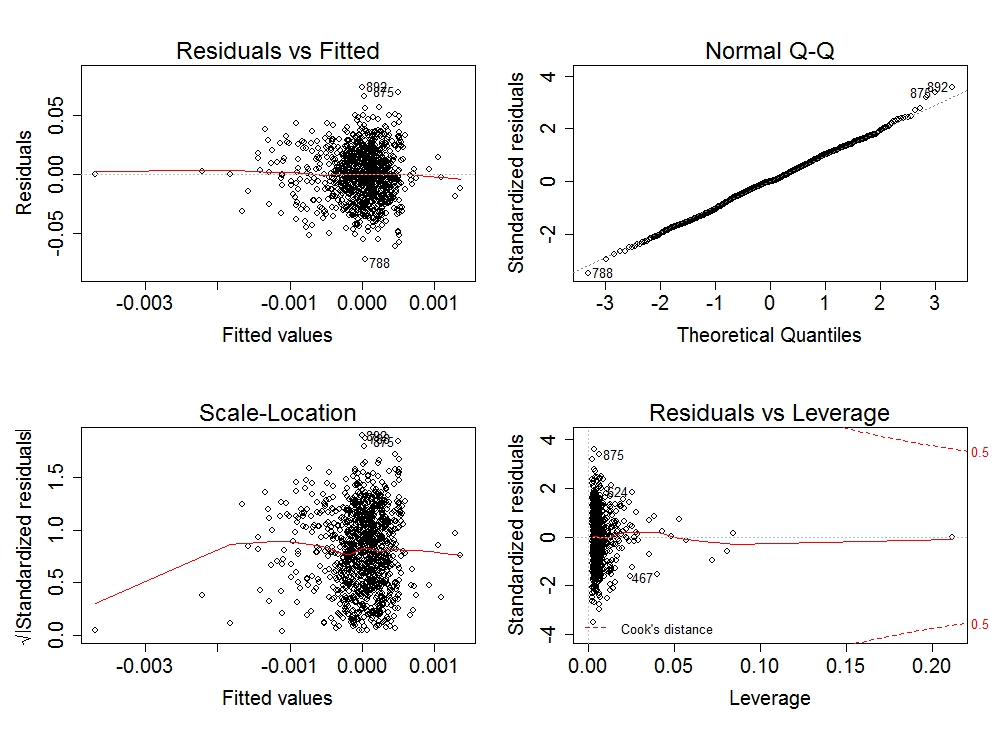
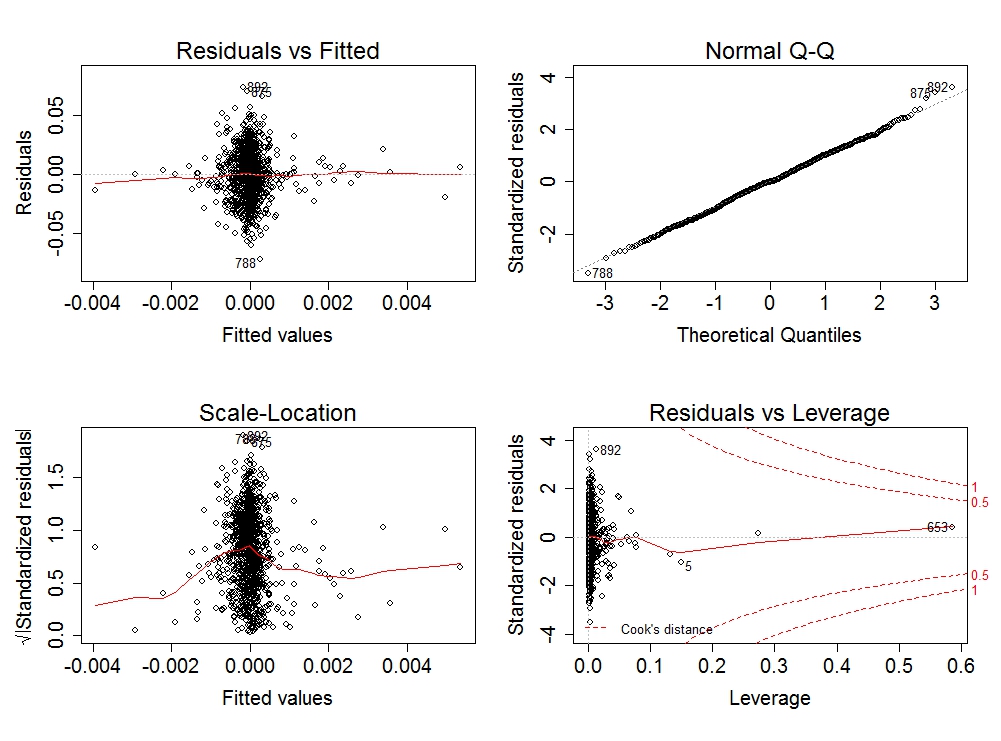


Figure S2. *Halichondria panicea*. Measurement of the projected area (*A*, mm2) of sponge explants (*ID*1 to *ID*3) as a function of time during respiration experiments with combined time-lapse observations of the explant osculum and body (Figure 1). Numbered boxes indicate contraction-expansion events (Table 1). Corresponding temporal changes in osculum cross-sectional area (*OSA*) and respiration rate (*R*) are given in Figure 2.



**Figure S3.** *Halichondria panicea*. Diagnostic plots of the relationship between temporal changes of respiration rate *R* (µmol O2 h-1) and state of the osculum cross-sectional area (*OSA*, mm2) when considering individual variation (*ID*).



**Figure S4.** *Halichondria panicea*. Diagnostic plots of the relationship between temporal changes of explant respiration rate *R* (µmol O2 h-1) and temporal changes in osculum cross-sectional area (*OSA*, mm2) when considering individual variation (*ID*).