Appendix 1

The heart rate (HR) and oxygen consumption (OC) of 4 *P. grandis* were measured simultaneously at 24.5 °C. Mussels had surgery one week before the experiment so that the probes on both sides of the shells were inserted, and the heart rate measurement was measured by impedance converter. Oxygen consumption was measured according to the methods described in Chapter 2. The DO decreased gradually as the mussels depleted DO in a closed chamber. In Figure A, different responses of OC and HR were exhibited by each specimen because of differences in physiological condition of the mussels. The mussel which can regulate (or maintain) OC under declining DO usually was in better condition. The heart rate of the mussels must increase to maintain the OC under declining DO, or the OC decreased when the DO decreased. The means of the OC and HR of the 4 mussels in Figure A are presented in Figure B. There was no significant difference in mean values of heart rate among test DO levels when the DO was higher than 1.0 mg/l (Fig. B). This is because of the high variation resulting from differences in physiological conditions of the individuals. However, the trend of increasing HR corresponding to decreasing of OC under declining DO was evident.
Fig. A Simultaneous measurements of the oxygen consumption and heart rate of 4 *Pyganodon grandis* under declining dissolved oxygen at 24.5 °C. **A.** A representative mussel which regulated oxygen consumption under declining DO (gross body weight = 114.8g); Pc was between 0.5 to 1.0 mg/l. **B.** Mussel which maintained its heart rate under declining DO (gross body weight = 164.8g). **C.** Mussel which started to open at DO = 6.5 mg/l (gross body weight = 96.8g). **D.** Mussel which started to open at DO = 5.0 mg/l (gross body weight =116.2g).
Fig. B  Simultaneous measurements of mean heart rate and oxygen consumption under declining dissolved oxygen for four mussels (gross body weight = 123.65 ± 14.27; mean ± SEM; N=4) at 24.5 °C. The pattern of oxygen consumption is different from those in Figure 2 (Chapter 2) because of the surgery conducted for heart rate measurements. There is a trend of increasing heart rate under declining dissolved oxygen, but the differences were not significant.