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CO_2-Driven Ocean Acidification Disrupts the Filter Feeding Behavior in Chilean Gastropod and Bivalve Species from Different Geographic Localities

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Abstract We present experimental data obtained with newly hatched veliger larvae of the gastropod *Concholepas concholepas* and juveniles of the mussel *Perumytilus purpuratus* exposed to three pCO_2 levels. Egg capsules of *C. concholepas* were collected from three geographic locations in northern (Antofagasta), central (Las Cruces), and southern Chile (Calfuco), and then incubated throughout their entire intra-capsular life cycle at three nominal pCO_2 levels, ~400, 700, and 1,000 ppm. Similarly, *P. purpuratus* were collected from both Las Cruces and Calfuco and exposed to the same pCO_2 levels during 6 weeks. Hatched gastropod larvae and mussel juvenile were fed with the haptophyte *Isochrysis galbana*. Clearance and ingestion rates were estimated for newly hatched larvae, and for juvenile mussel these rates were measured at two observation times (3 and 6 weeks). Our results clearly showed a significant negative effect of elevated pCO_2 on the clearance and ingestion for both *C. concholepas* larvae and *P. purpuratus* juveniles, which dropped between 15 up to 70 % under high pCO_2 conditions. The present study has also shown large variations in the sensitivities of *C. concholepas* larvae from different local populations (i.e. Antofagasta, Las Cruces, and Calfuco). The influence of both corrosive upwelling waters and the influence of freshwater discharges from Maipo River may explain the minor negative effect of high pCO_2 conditions in hatched larvae from Las Cruces' egg capsules, which would

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